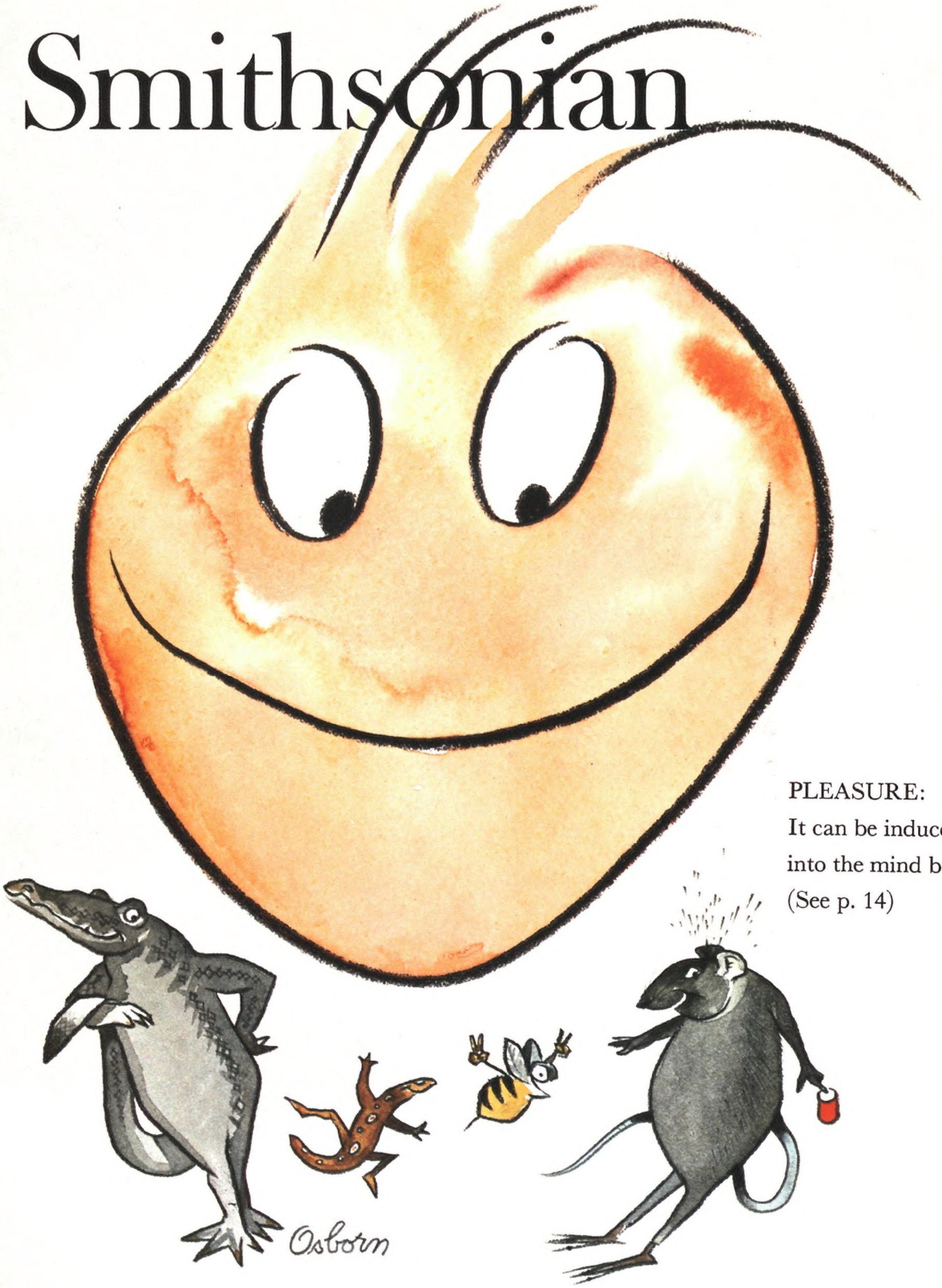
October 1971

Smithsonian



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(See p. 14)

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Smithsonian

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Standard Oil Company (New Jersey)

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Secretary Ripley's comments

The view from the castle

Smithsonian Institution prepares to mark the nation's 200th birthday in 1976 with new ideas embodied in new exhibits

The autumn of 1971 is upon us, and the magic year 1976 draws ever closer. That bicentennial of our nation will burst upon us with a positive mandate from every citizen to celebrate the event. Those of us who are keepers of the heritage of America have an obligation to do so. But how do we do it?

A presidentially appointed American Revolution Bicentennial Commission, in existence for five years, has found the problem mind-boggling. Individuals can hang out flags, drape buildings in bunting, ring bells, light firecrackers (where allowed) and pack the family in a camper to revisit historic sites, trying not to get too cranky in the process. Several cities, from Boston to Miami along the East Coast, have adopted plans contingent on acquiring some of the taxpayers' money. The commissioners doubt such money will be forthcoming and that in the end each region of America ought to celebrate in its own way.

The Smithsonian, of course, has been through this once before. The Centennial of 1876 was celebrated by the Philadelphia Centennial Exposition, and 100 years ago the Institution was preparing for it. The momentum of that exposition left us with a vast number of acquisitions and our second building, now called the Arts and Industries Building, completed in 1881, to help house them.

Now, a century later, the autumn days are filled with a vague presentiment. Four-and-a-half years is not much time to plan the budgets, let alone the ideas of how to mark our Bicentennial. Here in Washington, at least, we can concentrate on delineating the American Experience for the millions of visitors who will throng our nation's capital that year. Our Institution expects to play host to some 30 million people. We have a duty to remind them of our nation's past, the impact of our science, our technology and our culture on our surroundings and ourselves. For it is through these legacies that we may discern our future.

We hope to have an exciting new Air and Space Museum to show our guests. The Joseph H. Hirshhorn Museum and Sculpture Garden is already under construction. We will have a decorative art gallery, the Renwick, already nearly completed, and new exhibit areas in the Museum of History and Technology and the Natural History Museum. There will be special exhibits in the National Collection of Fine Arts and the National Portrait Gallery.

We hope also to have by then a Bicentennial Park on the Potomac River, dedicated to showing the experience of Americans, particularly those who fought the Revolution in the 1770s. We hope to have completed a major reconstruction of the National Zoo.

Generally speaking, we hope to show ideas, to explain to people why our country is this way—how it produced miracles of technology, shrewd insights, a sense of purpose and of self-confidence. Americans accomplished their achievements, perhaps, by pursuing truth as relentlessly as happiness. And here the Smithsonian has played its role with its collections from the past, conveying the truth.

Hopefully, we will use the Bicentennial to revive interest in these tangible truths as well as to illuminate our achievements and renew our confidence.

S. Dillon Ripley

A magazine as colorful, as varied, as fascinating as our past

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A MAGAZINE TO EXCITE YOUR IMAGINATION

The nationally acclaimed history magazine AMERICAN HISTORY *Illustrated* is the publication of NHS. This magazine abounds in generously illustrated articles by-lined by ranking historians. Measuring 8¼ x 11¼, it appears 10 times a year. In each issue, penetrating biographies, fresh portrayals of tragedy and triumph and the personal writings of history's participants make you a witness to the drama and excitement of our history. AMERICAN HISTORY *Illustrated* neither insults your intelligence with frothy, surface writing nor flattens your view of history with a dull, textbook approach. It is dedicated to telling history as it happened and telling it with authority, verve and candor. You'll get this magazine regularly when you join The National Historical Society.

A FOCAL POINT FOR YOUR INTERESTS

History, like most things in life, is enjoyed more when shared with others. That's the reason for NHS and the reason you'll find value in belonging. NHS offers a focal point, a gathering place for people who want to explore our American roots. We have no ax to grind, no causes to pursue save that our members enjoy history.

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Letters to the Editor

Rothko Chapel

Dear Sir: Rothko, in your August issue, has done an excellent job of portraying the "black, unbearable nothingness" which characterizes the night sky of any one of our major industrial cities.
Lawrence J. Morello
Miami, Florida

Dear Sir: It is too bad that someone with some taste and knowledge did not effectively oppose the creation of this ugly monument [the Rothko Chapel] to the aggressive, materialist exhibitionism of the de Ménils.

Wasn't it Molière who said, "He must be right, he's rich"?
Holgar Linden
Philadelphia, Pennsylvania

Dear Sir: I feel a little like the boy who couldn't see the Emperor's clothes, but to me those Rothko paintings resemble nothing so much as blackboards. The main duty of the guards, I assume, is to discourage small boys with chalk.
Louis G. Golver jr.
Houston, Texas

Spiders

Dear Sir: I read your article, "Spiders—feared, revered and loathed the world over," with a sort of horrid fascination. Unfortunately, I was eating my lunch at the time and, believe me, high on the list of things I'd rather not know is what a spider tastes like. The word from here is "ugh."
Mrs. Donna Crom
Santa Ana, California

Dear Sir: I was somewhat surprised to receive in my mailbox on the same day both the August SMITHSONIAN and the *National Geographic,* each with an interesting and beautifully illustrated article on spiders. Each of the articles seemed to be written with a view to dispelling the public's fear of spiders, belittling their ability to poison fatally, and to propagandize their usefulness to man and nature. Can this be mere coincidence? Is there now an Arachno-American Anti-Defamation League, with a web in the Capitol lobby, or maybe a lobby in the capital's web?
Thomas B. Bardos
New York City
We think neither SMITHSONIAN *nor the* National Geographic *is bugged by the League or anyone else, and Macy's doesn't tell Gimbels.* Ed.

Dear Sir: I don't like to quibble with your beautifully written and illustrated article on spiders, but I think you've made an error. You say that Arachne lost the weaving contest with Athena and, in losing, was changed into a spider. According to Ovid, *Metamorphoses,* Book VI, Arachne *won* the contest, and it was in the rage of defeat that the goddess Athena destroyed Arachne's tapestry. Arachne, terrified, hanged herself and was then transformed.
Robert S. Zelenka
Baltimore, Maryland
Other sources do not make the judgment of who won or lost in this mythological contest, but they do agree with Ovid that, in a fit of envy, Athena destroyed Arachne's weaving, transformed the maid into a spider and doomed her to spin forever. Ed.

Dear Sir: I'm always left a little indignant each time I finish reading an article on spiders. Coming originally from Australia, I've always taken questionable pride in the fact that the North Shore of Sydney harbored one of the most dangerous of the species—commonly referred to locally as the funnel web. Ann Moreton's article did not touch upon this monster. Also, there wasn't any mention of the "redback" spider—supposedly a close rival to the funnel web.
Peter R. Whyte
Forest Hills, New York
Ann Moreton's article dealt principally with spiders in the United States. A world

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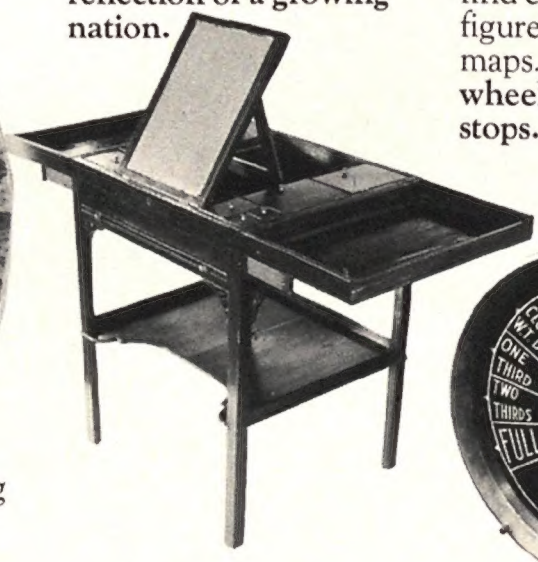
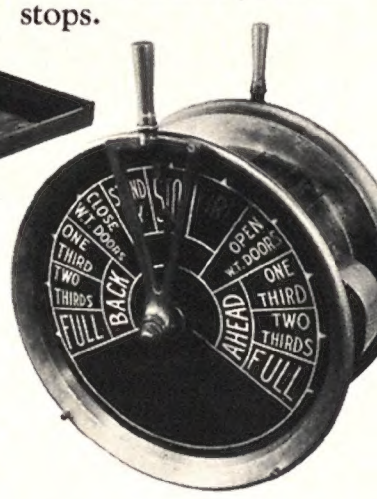
The turn of the century was a fascinating potpourri of coffee grinders and gramophones, corsets and bellows. See it all through Grandma's eyes at Stoner's Store in Fredericksburg. And if you love the sea, don't miss Newport News and the Mariners Museum, where you'll find everything from figureheads to ancient maps. In Virginia the **wheel of history never stops.**





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Virginia is for lovers

survey would include the funnel web (atrax), *and the redback is the black widow of Australia.* Ed.

Wildebeest

Dear Sir: As one of your charter subscribers, I assure you that I have not, over the past year and a half, been awaiting an inevitable error. But I do find one in your article on the Serengeti migration of wildebeest.

The wildebeest certainly is the most numerous, but it is *not* the largest of the African antelope—this distinction belongs to the eland, also found in the Serengeti, and weighing as much as five times the 400-pound wildebeest. There are several other antelope outweighing your gnu as well.

Last year, I fulfilled a long-awaited ambition to visit Africa, and in the Lobo area I was "caught up" in part of the southward migration. This is an unforgettable experience, the sight and sounds of which are indescribable. Dmitri Kessel's photographs of this activity are the best I've seen.

It is my fervent hope that the Serengeti will not go the way of areas such as parts of Amboseli, where the Masai herds have devastated the grasslands. Only through continued vigilance and good game management will these magnificent areas of animals be preserved for future generations to see. This spectacle is much more than just a tourist attraction—rather it is a vanishing phenomenon in our times of exploding population.
David O. Johnson
Portland, Oregon

Dear Sir: Having seen the wildebeest, photographed it and painted it, I would like to point out that there are at least three other antelope larger: giant eland *(Taurotragus derbianus),* which weighs from 1,000 to 2,000 pounds; greater kudu *(Tragelaphus strepsiceros),* which weighs from 600 to 700 pounds; roan antelope *(Hippotragus equinus),* which weighs from 500 to upwards of 600 pounds. There are, as you certainly know, two kinds of eland—the giant eland and the Cape eland, both of which are much larger than the wildebeest.
R.H. (Cap) Blohm
Provo, Utah
While the wildebeest is among *the largest of African antelope, it is true that the*

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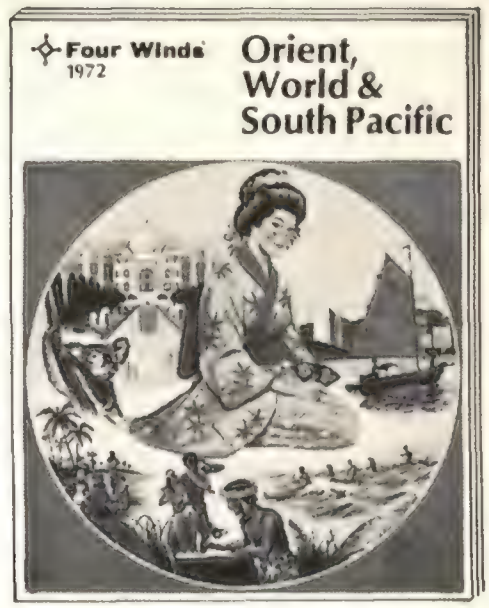

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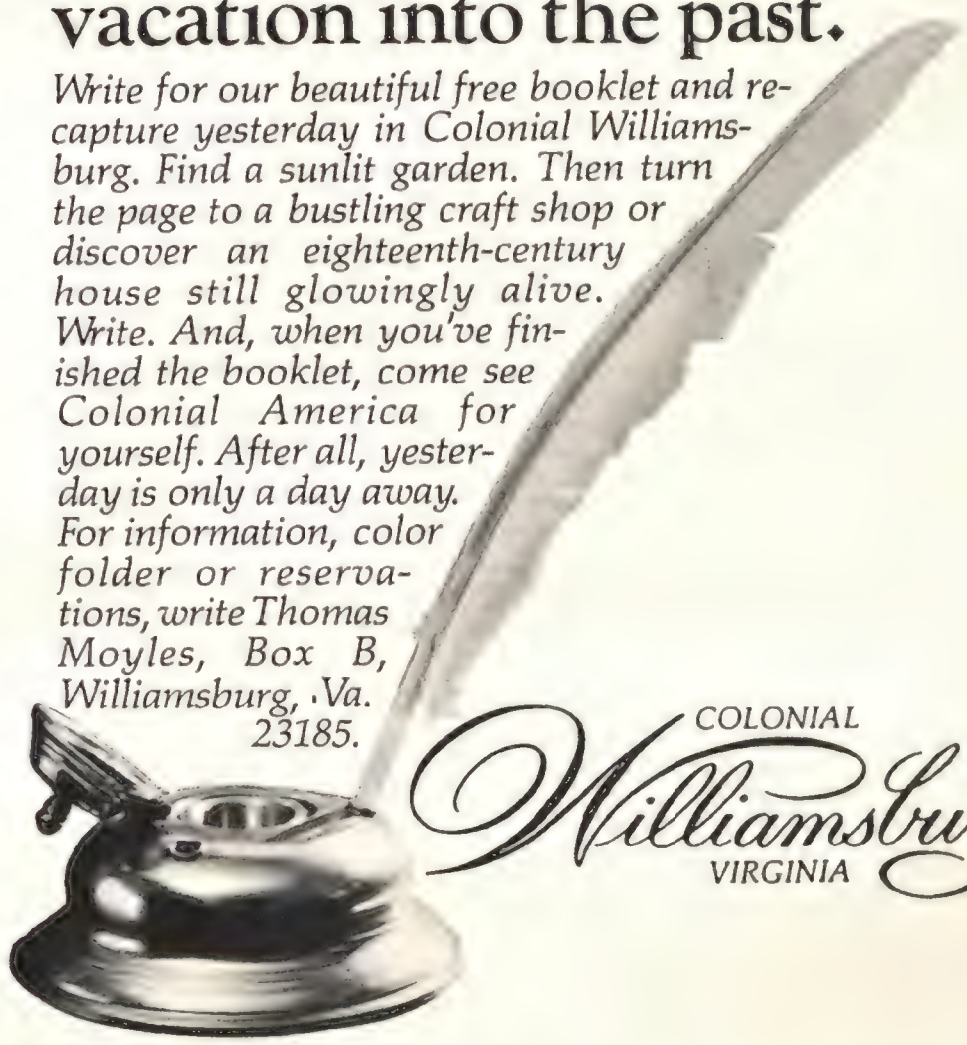

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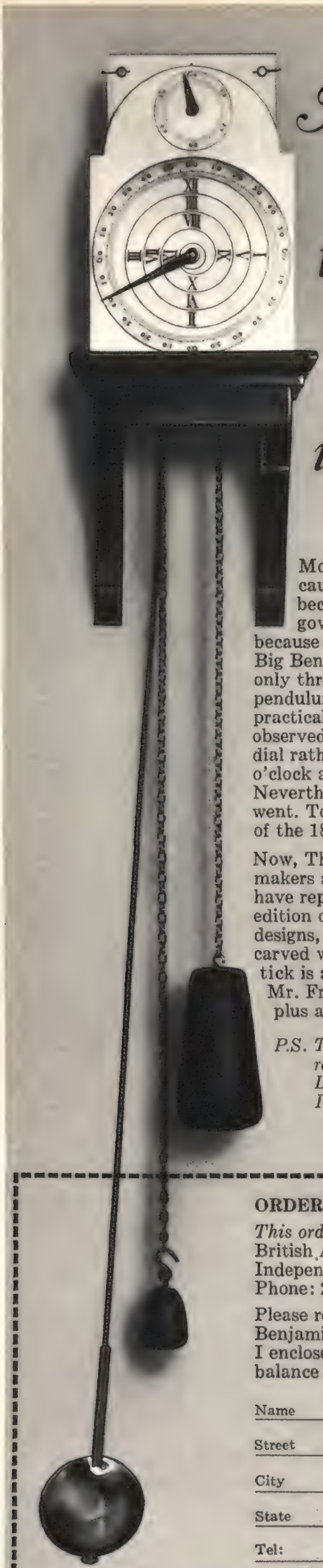

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giant eland is by far the biggest. Shown below, Africa's largest antelope, the giant eland, may be as tall as 69 inches at the shoulder and may weigh up to a ton. Ed.

Dear Sir: I tripped over some of the statements in your article on the wildebeest migration. Aside from the comparative size of the wildebeest, I think "the annual 800-mile mass migration from the grassy Serengeti Plains [and] south again . . ." is closer to 80 miles unless there's a heap of zigging and zagging on the way.
Frederick T. Wehr
Baltimore, Maryland

There is indeed a heap of zigging and zagging as L.M. and M.H. Talbot point out in "The Wildebeest in Western Masailand, East Africa." ". . . The minimum migration distance covered by the animals on the route that we followed was 824 miles. The routes are by no means direct and apparently several different routes are taken. . . . The migration paths are roughly circular and usually clockwise. . . . The movements are highly irregular and involve constant shifts of direction, doubling and circling back. . . . No two year's or season's movements necessarily will be alike." Ed.

Before Columbus

Dear Sir: I found William C. Sturtevant's review of *Before Columbus* by Cyrus H. Gordon to be somewhat less than adequate. He fails to critically and objectively review Gordon's hypothesis or to honestly evaluate his data.

Before Columbus reopens an issue that anthropology has long considered to be closed. Most anthropologists today discount the possibility of pre-Viking trans-

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Recycling is "old hat" to the steel industry. For the past 30 years, more than half the raw material used to make new steel has been old steel. Today's cans and cars and carpet tacks and thousands of other products are made from steel recycled from yesterday's cars and carpet tacks and thousands of other products—29,000,000 tons' worth last year alone.

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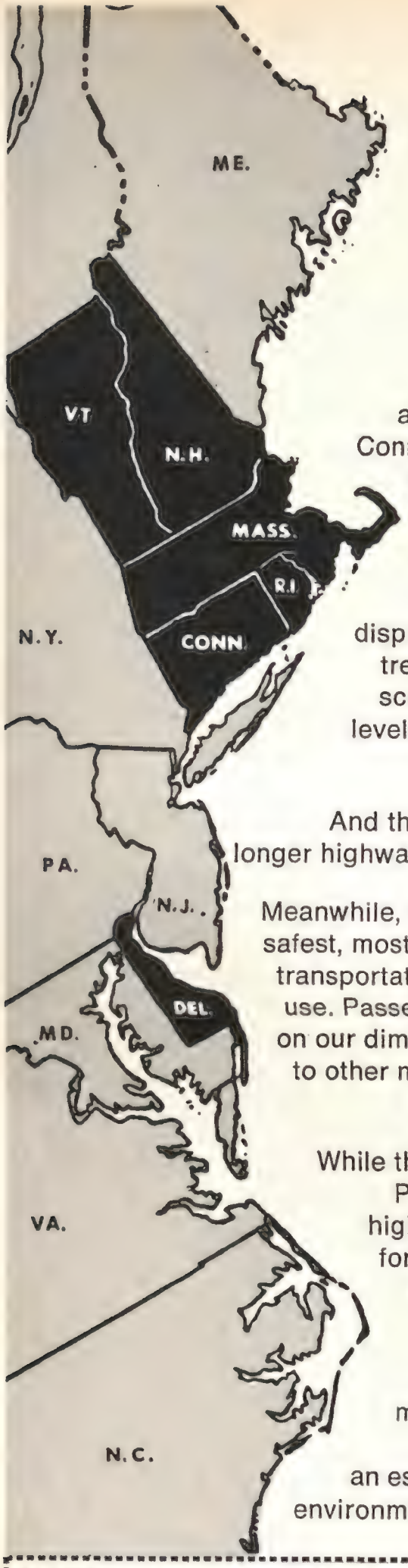

The Six "Missing" States

The maps don't show it, but an area exceeding that of the states of Connecticut, Delaware, Massachusetts, New Hampshire, Rhode Island and Vermont has now been paved over for motor traffic.

How many families have been displaced from their homes, how many trees have been uprooted, how many scenic areas have been scarred and leveled by the roadbuilders' bulldozers is anyone's guess.

And the building of bigger and wider and longer highways and "freeways" goes on and on.

Meanwhile, only a small fraction of the nation's safest, most efficient and economical means of transportation—the railroads—is being put to use. Passenger trains make no new demands on our diminishing land resources. Compared to other modes, railroads create a negligible amount of air and noise pollution.

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Atlantic contacts. They, like Sturtevant, argue that "human inventiveness" and the "tremendous variability of cultures" adequately account for the vast similarities between the ancient civilizations of the Near East and Mesoamerica. I believe their position is untenable. First, there is no evidence which directly refutes the possibility of maritime contacts. Second, Gordon and others present many lines of evidence that suggest the possibility of such contacts over an extended period of time; and lastly, it is illogical to account for cultural similarities by stressing cultural variability and human inventiveness.

Walton Boston Koch
assistant professor of anthropology
Montana State University
Bozeman, Montana

Dream city

Dear Sir: I was interested in your article in the July issue, "France's planners draw blueprints of an urban dream." But if the drawings of the proposed city of Vaudreuil are representative, I'm sure I would not like to live there. The buildings look like big, stacked-up cracker boxes—extremely dreary. The children may be able to walk to school safely and expeditiously, but what will they see on the way to inspire interest or creativity? I think more imagination and not so much technology and convenience features need to be stressed to have real quality of life.

Although I am in my 80th year, I do not believe that my attitude is just nostalgia for the past. Let us plan for beauty and joy, not ugly, stacked-up efficiency.

Mrs. A.W. Hayward
St. Paul, Minnesota

Back issues

Dear Sir: I have a collection of all of your first year's issues except July, August and December 1970, which I understand are no longer available. I hope that some of your subscribers may be willing to part with these back issues.

Mrs. Claudette Richards
Newark, Ohio

These issues can be mailed to SMITHSONIAN *magazine, Smithsonian Institution, Washington, D.C. 20560. We will forward them to Mrs. Richards and others who have requested them.* Ed.

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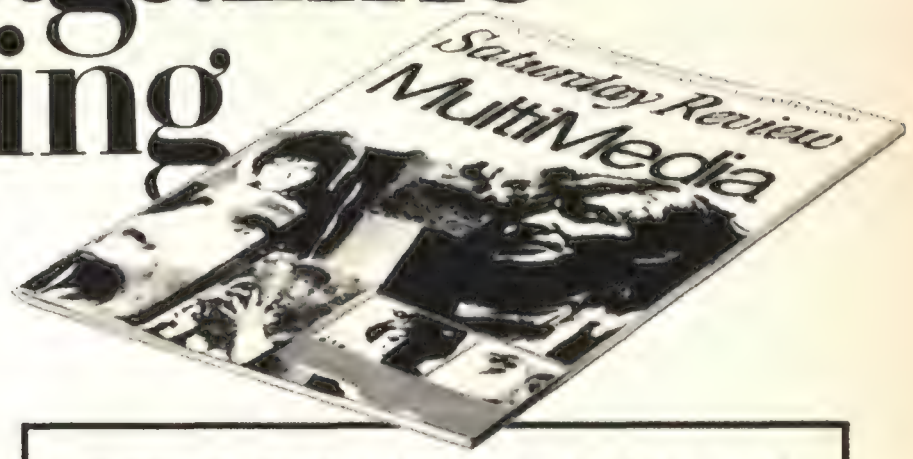

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THE THOUGHT-WEEKLY
380 Madison Avenue New York, N.Y. 10017

By H. J. Campbell

Pleasure-seeking brains: artificial tickles, natural joys of thought

From fish to Man, the brain's pleasure areas can be turned on by electrodes or by the senses. Only human brains provide their own pleasures

A pleasing buzz in the brain is beyond plants

For some years now it has been known that animals will choose to press a lever repeatedly when the only thing that happens for their trouble is that they receive a very small amount of electricity in certain regions of the brain.

Rats engaged in this intracranial self-stimulation will press the lever so frequently and for so long that they drop to the floor of the cage with fatigue. After a little sleep, they awaken and immediately start to press the lever again.

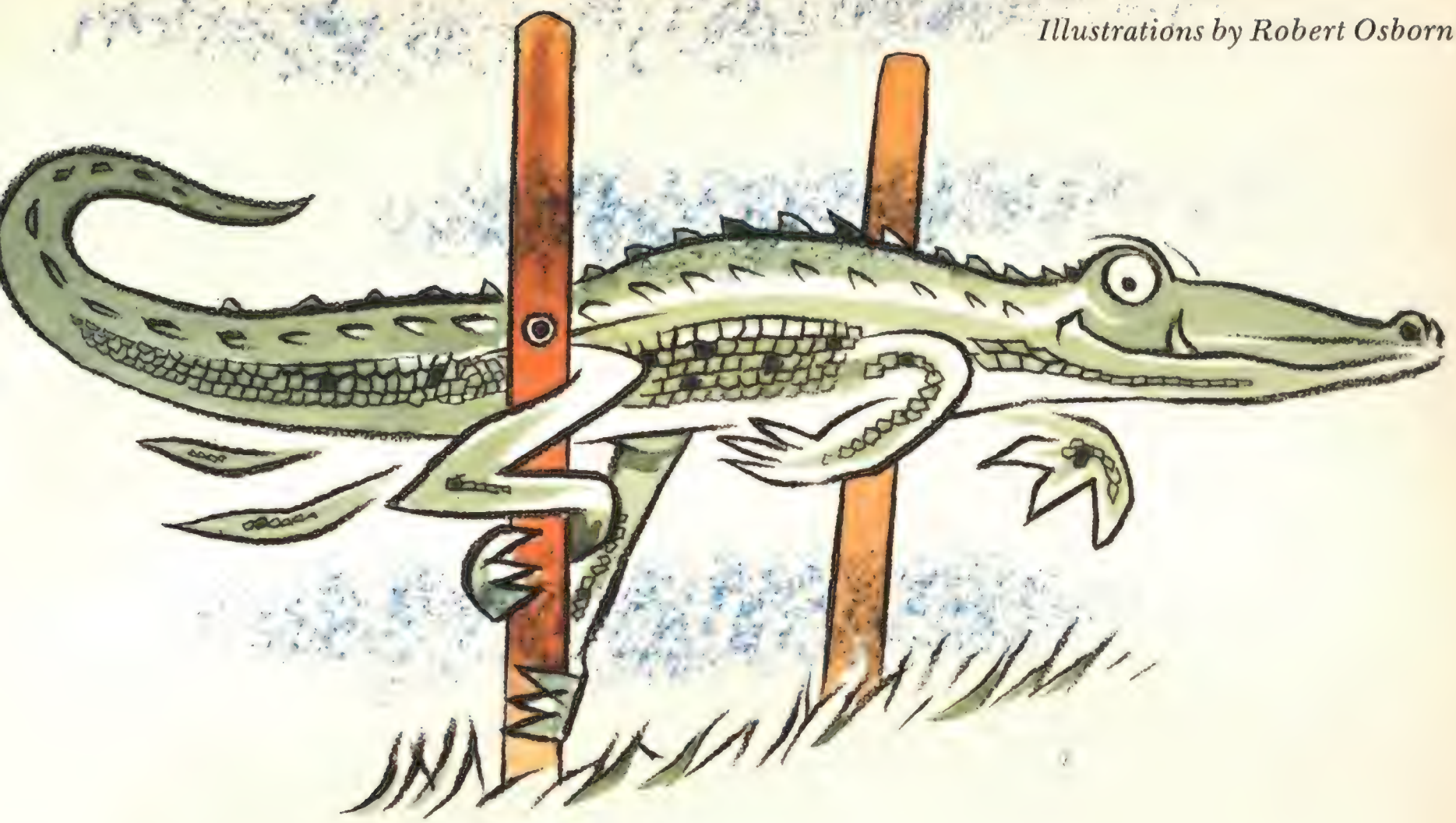
When the electricity, by means of indwelling electrodes and a simple stimulator, goes to parts of the brain within what has been called the limbic system, the animal seems to want nothing else out of life. If it is a hungry animal, it will choose a lever for brain stimulation rather than a lever which it knows will provide food. More significantly, it will do this even if made thirsty, selecting brain stimulation rather than a source of water. Many other tests have shown that this kind of brain stimulation takes priority in the animal's behavior over any other kind of reward. It is not surprising, then, that the brain regions involved have been named the pleasure areas and that the lever-pressing is called pleasure-seeking.

I am a physiologist, concerned with normal functions, and the terrible compulsiveness of this pleasure-seeking behavior bothered me very much. It has led me, as I will show, to a new theory for explaining all behavior—or at least the behavior of animals ranging from fish to Man himself.

The presence of pleasure areas in the brain was discovered accidentally in 1954 by James Olds and Peter Milner in Canada. Since then many workers

Dr. H. J. Campbell is a physiologist and senior lecturer at the Institute of Psychiatry at De Crespigny Park in London, England.

Illustrations by Robert Osborn



Electric kicks through a crocodile's thick hide

have demonstrated the same phenomenon in a variety of species—cats, dogs, sheep, dolphins, goldfish, monkeys and Man (see cover). The humans were mental patients of Dr. Robert G. Heath at Tulane University School of Medicine. They were provided with a button they could press if they wanted to. And they did want to, often. When asked why they were pressing the button, the patients replied that it made them "feel good" and gave them a "happy feeling."

Notice especially that there is no question of an electric shock to the brain, in the ordinary sense of the term. The amount of electricity supplied is intended to be of the same order of magnitude as the charges naturally developed in the brain by cellular activity. A considerable amount of interesting and provocative theorizing has been going on about the meaning of intracranial self-stimulation responses. For me, the thought of humans acting this way engendered unease. When all is done and said about intracranial self-stimulation as a means of seeking pleasure, we are left with the persistent thought that this is not like any pleasure that we have experienced yet.

I have no doubt at all that experiments using the method of intracranial self-stimulation are of great value. But I do not believe that it is a *natural* form of behavior. It is unlikely that anyone else thinks it is natural, either. Yet no one seems to have asked what

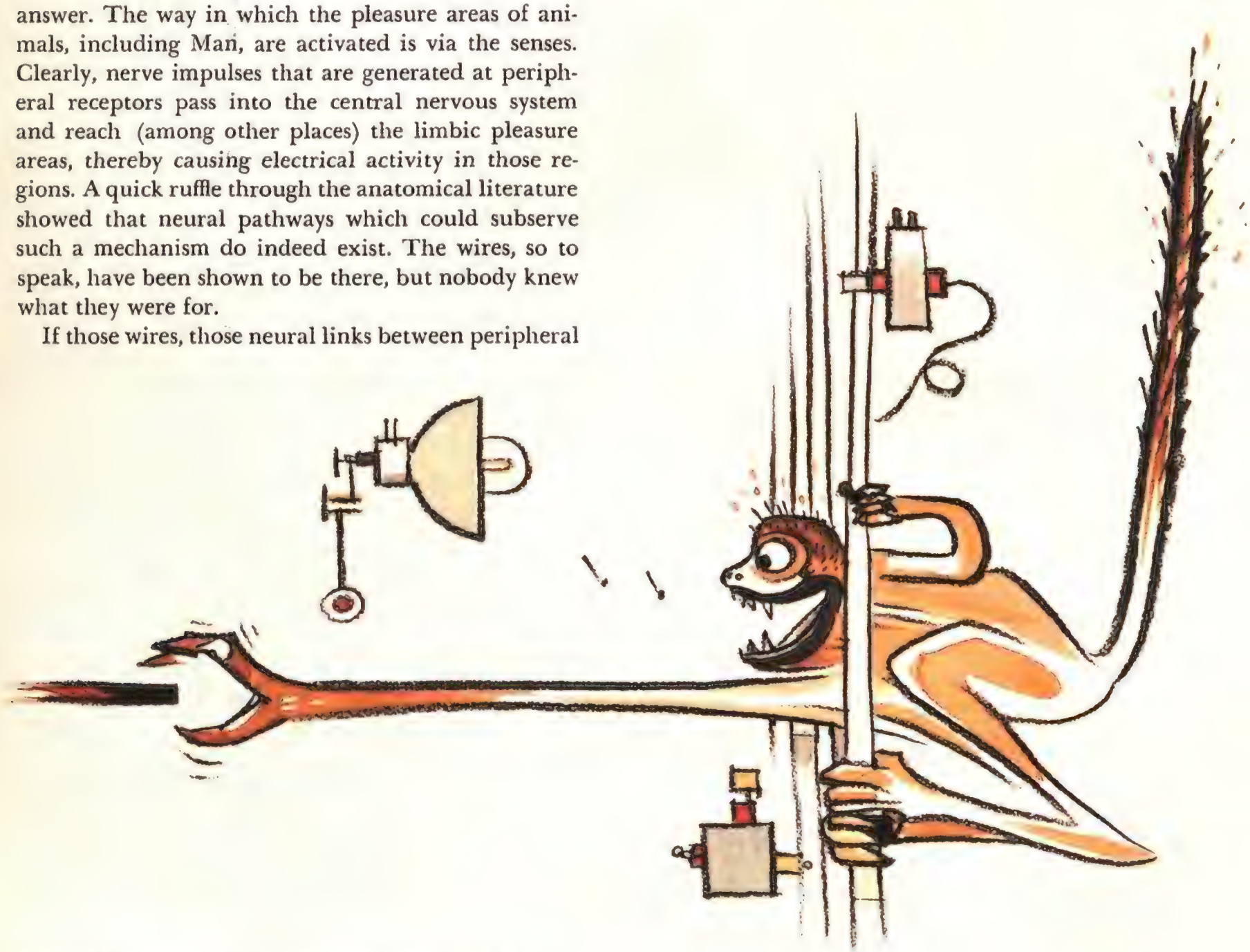
From the goalposts, a quantum of fishy joy

to me was a very obvious question—namely, how do the pleasure areas become activated in normal life?

Not only was the question obvious. So, too, was the answer. The way in which the pleasure areas of animals, including Man, are activated is via the senses. Clearly, nerve impulses that are generated at peripheral receptors pass into the central nervous system and reach (among other places) the limbic pleasure areas, thereby causing electrical activity in those regions. A quick ruffle through the anatomical literature showed that neural pathways which could subserve such a mechanism do indeed exist. The wires, so to speak, have been shown to be there, but nobody knew what they were for.

If those wires, those neural links between peripheral sense organs and limbic regions, were concerned in the production of pleasure, then certain things would inevitably follow. Almost by immediate inference, one could say that if I were right, then animals would press a lever (or do some other task) at their own volition, purely in order to obtain stimulation of peripheral sense organs. It should be possible to demonstrate peripheral self-stimulation. No electrodes in the brain, no electric currents to the brain, just stimulation of the eye or the ear or the skin or whatever.

The modern term for this sort of idea is almost certainly "way out." So I did the initial experiments at home, all alone, using an aquarium of tropical fish. I made a set of electrodelike goalposts that went into the water of the aquarium. A beam of light passed between the electrodes and fell upon a photocell. The photocell was rigged as a switch to a stimulator that would send a small pulse of electricity into the electrodes when the light beam was obscured. The elec-



A monkey just can't wait for its peripheral tickle

Extinction: too much of the wrong pleasures

tricity would, of course, pass through whatever was cutting off the light.

My hope was that the fish would, definitively, cut off the light. And this they did. Within minutes of setting up the apparatus, fish were swimming repetitively back and forth through the beam, getting each time a quantum of—what would you call it, stroking, tickling, caressing?

It was certainly not the light beam which attracted the fish, for when this was left on while the stimulator was switched off the animals swam through the beam no more than a chance number of times. Also, when the water contained a local anesthetic, they showed no interest in the apparatus even though the light and the stimulator were on. Would *you* enjoy being kissed after a tooth extraction with procaine?

These preliminary experiments encouraged me to go ahead with the project, using more sophisticated apparatus and a wider range of animals. I moved on to amphibians and reptiles, and found that newts and terrapins would seek out a source of electric current in the water. Most impressive, though, was the crocodile, for these creatures are well-known to be among the most sluggish kind.

The crocodile in my laboratory spends its time—for many hours on end—lying motionless on a stone slab. But when the goalpost-electrode assembly is put into its tank, the creature lumbers backwards and forwards between the electrodes about 50 times in 15 minutes. Sometimes, due to its largely immobile life, the crocodile becomes coated with green algae. It will not then respond to the electrodes until after its exterior has been scrubbed. The algae would seem to be forming an insulating layer over the skin receptors.

My next step was mammals, and I found that rabbits would press a lever for a longish flash of bright light. Moving on to primates, I tried the squirrel

Late bloomers do not reach sensory-pleasure stage.

monkey. We have a capacitance rod, which looks and feels just like a piece of metal but is in fact a switch. This is connected to a stimulator that will activate a lamp whenever the rod is touched. The light goes out after five seconds unless the rod is released and touched again. When totally undeprived squirrel monkeys have had the rod pushed through the bars of their cage for a day or two for 15 minutes each day, they begin to reach through the bars and grab the rod before we can slide it in. As soon as they see the rod they begin to make happy, anticipatory chirping noises. They then touch the rod about 500 times in 15 minutes when a 750-watt bulb is the stimulus. With no light they touch the rod only about 20 times.

These experiments all show that peripheral and intracranial self-stimulation have much in common. One feature, however, is very different—and of great significance. It has been pointed out in many studies that a characteristic feature of intracranial self-stimulation is a lack of satiation: The animal never wants to stop pressing the lever. But with peripheral self-stimulation, all the animals tested, from fish to monkey, show a gradual decline in response rate down to zero when allowed the possibility to stimulate themselves indefinitely. This, surely, is much more like what happens in normal life.

While demonstrating the fact of peripheral self-stimulation from fish to monkey, I thought about its implications. There seemed no need to carry out any experiments with the highest primate: Even a brief glance at much human behavior reveals that it consists of a search for stimulation of the senses. Stimulus-seeking is by no means a new idea in psychology, or philosophy, but I developed a theory which establishes a neurological basis for stimulus-seeking—and indeed, I believe, for all animal behavior, at least from fish to Man.

We have seen that when the pleasure areas have electrodes in them, the animal is disinclined to engage in any behavior except lever-pressing for electrical stimulation of its brain. In peripheral self-stimulation, the animal obtains electrical activity in its pleasure areas by ensuring that sense organs generate nerve impulses which travel from the receptors to the limbic system. With this "natural" method, the animal does not continue indefinitely to ensure stimulation of a set of receptors. It does not, for example, go on and on eating, in order to make its taste buds act like electrodes in its brain.

We may ask why the animal reaches satiation. The answer is simply that all receptors exhibit a property known as "adaptation," which means that they cease to discharge impulses after a while even though the stimulus continues. Because of this property there comes a

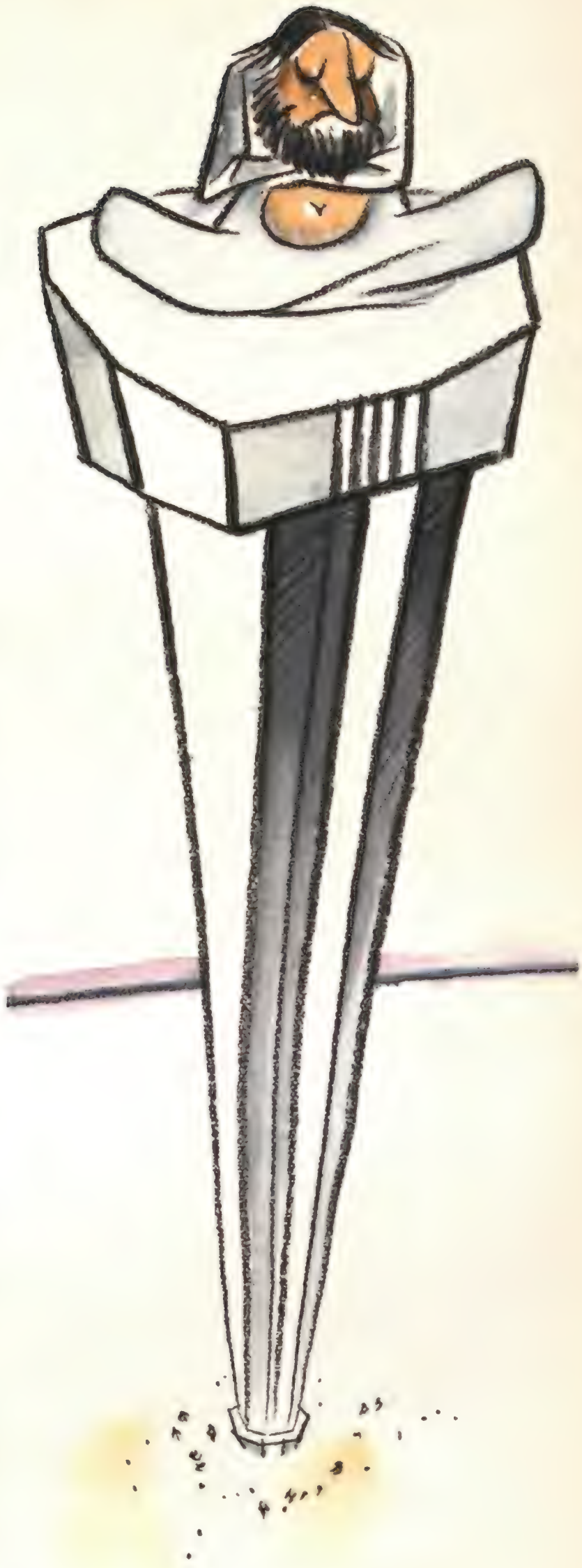
When drinking bourbon, a man is no closer to the ape than he is to the fish

From magic to religion—and pleasure-control

point in any pleasurable activity where continuance of the stimulus will *not* cause activation of the limbic pleasure areas. What seemed important to me about satiation, and which does not appear to have been given attention by other scientists, is that when an animal reaches satiation it does not stop behaving; it changes its behavior. Whereas intracranial self-stimulation is just one damned thing, peripheral self-stimulation (that is, natural behavior) is just one damned thing after another.

Thus it seems that we have here a neurological basis for the daily round of behavior—if we make just one assumption, which, sadly, can never be proved. The assumption is that in the course of evolution, when the nervous system reached a certain degree of complexity (at the moment we must start with the fish brain), the way in which it was put together demanded that the *pleasure areas be kept active.* Was this the "program" for the ancestral brain computer? If so, then much that has been vague and ill-defined about the animal kingdom and its history becomes readily explainable.

If we assume that animals, at least from fish to Man, *must,* in the sense defined, keep the limbic areas of the brain electrically activated, then we now know why animals behave and plants do not. We can explain Behavior as well as specific kinds of behavior, and we can now see the material basis of evolution, survival and extinction. In evolution, random genetic mutations have brought about gradual improvement of the motor system and nervous system, so that animals have become more competent at finding and manipulating the sensory stimuli available in the environment. Some animals found pleasure (that is,



Is contemplation the highest form of pleasure?

activation of parts of the limbic system) by stimulating their receptors in ways which were biologically disadvantageous: They became *extinct.* Others were spawned in an environment that, in a sense, was akin to the intracranial electrodes, conforming in near-perfection to the ancestral command, the intrinsic "program." Such animals exhibit remarkably slow evolution; why should they change their form or seek new sensory pastures? Still other animals chose advantageous means of seeking pleasure and also survived. From them evolved humankind, an animal with no fixed ecological niche, still motivated to wander and spread and explore the sensory surroundings and still, let us hope, to evolve.

But with the evolution of the human brain a very significant advance occurred. Few people doubt that Man is the highest animal. Fewer still could say in realistic, nonemotional terms why they believe this. Theories such as the notion of Man as the only creature to make tools on a systematic basis, have fallen by the wayside, plagued with qualifications.

Many would take refuge in saying that the human brain shows the most complex structure, having that enormous amount of convoluted cerebral cortex. Numerous others would point to Man's works, his institutions, laws, religions and his overwhelmingly superior power to tamper with his environment. Caught up in both of these concepts is a rather tremulous adumbration of Man's uniqueness in being rational. Those who closely live and work with lower animals, especially but not exclusively with primates (do you own a dog?), have grave cause to doubt Man's prerogative of reasoning. And, pitifully, many who work closely with people doubt it too. What, then, is *human* behavior?

According to many experts, the experiments on

Treasures of the mind form the human birthright

peripheral self-stimulation carried out so far leave no sensible doubt that the neural mechanism of pleasure-seeking, of activating these limbic areas, requires no more complexity than the very simple brain of a fish. Obviously, with such a simple brain, there can be only simple pleasures. Equally obviously, even with a much more complex brain and much more complex sensory pleasures, the essential fundamental mechanism of action must be the same as that of a fish or a terrapin or a crocodile.

When people engage in a behavior that is a source of pleasure solely, or predominantly, because it stimulates their sense organs, then they are using their complex brains, that "enormous amount of convoluted cortex" to enable them to do what a fish or a crocodile does, only to do it much better—though possibly more expensively and harmfully. Should there be any people whose behavior is totally sensorially oriented, then they are not human, inasmuch as their behavior is, stripping off the technological veneer, the same as my monkeys or my fish. It is unlikely that such people exist. In the real world, we can say that the extent to which an individual's pleasure is obtained solely from the senses is the extent to which that individual is subhuman. Hard words. But these are hard times and we must face what seems to be the truth.

What behavior, then, is uniquely human? My theory is this, and you may take it or leave it at your own peril. It was said previously that a very significant advance occurred in the evolution of the human brain. It is this advance, and this advance only, which distinguishes some people almost all of the time and

It takes brains to get such pleasure from sex

Evolution irrevocably works towards a thinking organism, rather than a feeling organism

most people some of the time from the lower animals.

Neuroanatomists and some electrophysiologists have demonstrated that neural pathways exist between the cortical thinking regions of the brain and the limbic system and that nerve impulses flow downwards from the higher to the lower regions. We can now draw a distinct materialistic, nonreligious, nonphilosophical line between human and nonhuman behavior. Human behavior—meaning that not found in lower animals—is behavior that causes activation of the limbic pleasure regions of the brain, *not* as a result, primarily, of the sense organs, but primarily as activity of the brain's thinking regions. We all know that some people derive pleasure from non-sensory activity. Some of us are fortunate enough to be among the group who can have fun with mathematics or philosophy or science or languages or chess or crossword puzzles or reveries or anticipation or anything else that prompts us to behave without actually stimulating the sense organs, except, perhaps, adventitiously, as in music. When we are doing those things, those *thinking* kinds of things, we are being human. For, as far as we now know, the lower animals do not engage in behavior such that the process of thought is the reward. Only in the human brain can thinking activate the limbic pleasure areas.

Vandalism is mere apelike sensation-seeking

It is pleasure-by-thinking that separates humans from lower animals. It is not true that the apes are nearest to us, unless we are overawed by anatomy. When a man is drinking bourbon he is no nearer to the ape than the fish. And whatever the ape does, he is as near to fish as to Man.

Usually it will be found upon analysis that unsuitable human behavior is firmly based upon materialistic, sensory objectives. Magic evolved into religion because of this. The main teaching of all major religions is, in effect, to moderate the sensory pleasures and give more importance to thinking, to be less subhuman and more human. In Oriental religions contemplation takes pride of place. Legal systems, which are uniquely human institutions, are essentially involved with reducing, by penalty, behavior based upon sensory pleasure-seeking.

Sexual mores in their multiplicity reflect the gigantic role that sexual behavior plays in the lives of people, as compared with lower animals. Whereas with lower animals sex is merely a part of life, it often dominates the human scene, so that some subscribe to the Freudian idea that "everything is sex." Since Man can turn his superior sensorimotor abilities to great

account, he has made sex the most potent source of sensory pleasure, involving many more kinds of peripheral receptors than any animal uses. It is unlikely that any other form of behavior focuses so great a barrage of nerve impulses into the limbic areas of the brain.

There are many other implications of this theory which throw light upon the present state of Man. The direction of the arts towards abstraction, classical music towards mathematical design, architecture towards rhythmic functionalism; the occurrence of psychedelic predilections in the immature, the rise of vandalism and delinquency among juveniles, the mass hypnosis of the sensory communication media—all of these would bear an appraisal from the point of view of the new theory. But what of the future? Is the new theory one which implies hope or doom?

If I am right, evolution is moving with its traditional unalterable irrevocability towards a thinking organism rather than a feeling organism. Gradually, Man's brain structure and function are slowly changing, independently of his institutions, political systems and ideologies. Survival of the fittest applies, now, not to the sensorimotor people but to the thinking people. Natural selection is working in favor of mind, not muscle. Therefore Man's biological destiny is eventually to be fully distinguishable from the lower animals, by virtue of his behavior being totally directed to activating the limbic pleasure areas by exercising his capacity for thought, using his sense organs as ancillaries to mental phenomena. Each of us must decide whether that is cause for hope or despair.

If we take hope in it, then we do not have to wait for random mutations. The brain can be changed by experience as well. By recognizing what is human and what is subhuman behavior we can exert pressures upon ourselves and upon those around us, especially our children, to choose the human way of doing things. If we teach that the destruction of property—in the name of whatever freedom—is apelike sensation-seeking, if we show by preaching and preeminently by example that the rich store of human civilized treasures of the mind form the birthright of human people—if we do all this and more of its kind, we might well speed the course of Man's evolution. For whether or not a given *individual* is human or subhuman depends upon what has happened to him, not upon his genes. It depends upon the values and philosophy of life built into the potentially human brain with which he was born, wherever he happened to be born, whatever his color.

The laws of biology, I believe, are taking care of Man's evolution, with or without his help. But if we are really going to take the future seriously, it would be erroneous to continue with our totally man-centered anxieties alone. We have seen that the basic mechanism of behavior is present in the simple neural organization of the fish brain. There is no reason to believe that there is anything special about fish. Even lower animals, the invertebrates, seek their simple pleasures. We cannot rationally believe that the evolutionary processes that resulted in Man are not also at work in other animal hierarchies.

What will happen, do you suppose, when, millenia from now, some kind of activity in the higher centers causes activation of the pleasure areas in the brain of the octopus? We are not alone upon this planet. Nor has evolution ceased.

With evolution still at work, what next?

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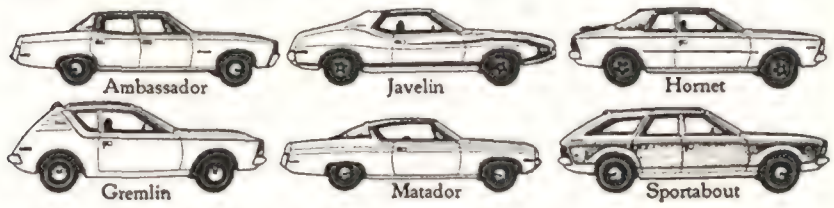

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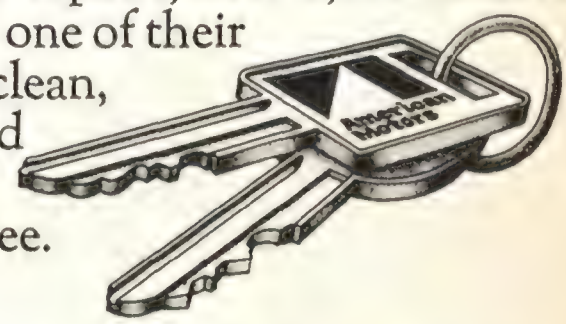

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Salmon spectacle: autumn run of spawning sockeye

Returning from the Pacific to the streams of their birth, millions of fish swim as far as 700 miles inland to breed, then die

It is October and the sockeye salmon have long left the sea. Hundreds of miles up Canada's Fraser River in British Columbia they have bested strong currents to reach specific gravel beds in fresh-running rivers and creeks which were their own birthplaces.

All summer long they have streamed from the Pacific Ocean through the Juan de Fuca Strait and Puget Sound where American and Canadian fishermen have awaited them and loaded their boats with the blue-silver bounty.

In the ocean for three of the four years of their lives the sleek Fraser-spawned sockeye range northwestward 2,000 miles into the Gulf of Alaska and beyond, grazing on plankton which they screen through their gills. Then, responding to instinct and guided in ways as yet unknown—perhaps by the sun, the stars, still unrecognized electric impulses or, nearer land, by odors that remind them of home—the mature fish, now

The Adams River runs red with sockeye when these fish return to their freshwater birthplaces in British Columbia. How they navigate to their native streams is still a mystery.

weighing an average of about six pounds, head for the coast and somehow reach their own home streams. On their scales they bear microscopically visible patterns that identify the specific spawning grounds of each race's origin as definitely as whorls of a fingerprint identify a man.

Each race has its own definite schedule by which it reaches its spawning grounds when the temperature of the water there should be low enough for spawning, yet high enough to develop the eggs. Until scientists discovered how to distinguish one race from another, effective regulation to assure enough brood stock of each race was impossible.

In peak condition, they cease to feed, and enter fresh water, living only on fats stored while they pastured in the sea. The farther they have to travel upstream the fatter they must be at the start. Because the Fraser sockeye have spawning grounds as much as 700

By Betty W. Carter

Photographs by Dan Guravich

The author has written two books with her husband, Hodding Carter, the liberal publisher of The Delta Democrat-Times *in Greenville, Mississippi.*

The labyrinthine Fraser River basin empties into Pacific through Juan de Fuca Strait. Red areas (which the author visited) and dark blue areas indicate prime sockeye spawning tributaries. Light blue marks potential spawning grounds while black designates places that are unsuitable for the breeding of salmon.

miles upriver, their flesh constitutes a rich source of food for a hungry world.

To reach the Fraser watershed and the spawning grounds, the salmon must first go through Hell's Gate. Here, 130 miles from the river's delta, the Fraser is pinched between two mountains. Along the precipitous walls of the canyon man has engineered roadbeds for two railways and a highway. It was in the early summer of 1913 during construction of the second railway that disaster occurred.

Without thought of consequences for the salmon, construction workers dumped choking debris into the gorge. The narrow passage which had always been dangerously difficult for the sockeye became impassable. For ten miles downstream, 12 million red bodies milled in desperation as spawning maturity came and passed. Unspawned fish, dead by the millions, littered the lower reaches of the river. The salmon catch declined year after year after year.

Spawning a solution

In the late thirties, far less was known about the sockeye; it was not even yet proved that salmon return to the streams of their birth to spawn. The International Pacific Salmon Fisheries Commission was established to investigate the drastic decline in the sockeye population. Research revealed that the Hell's Gate obstruction was one major cause, so, in 1945, the Commission invented and installed a new type of fishway to help the salmon pass the impediments. Long concrete passageways were constructed opening into the water along either side of the gorge, each beginning and ending beyond the obstructions. Full-length vertical slots at each end make entry and exit possible at varying stages of the river which can rise as much as seven feet in a day. The fishways are so arranged that exit is only possible where it will be safe for the sockeye to reenter the main channel. The fishways are covered to protect them from possible slides.

The Commission is now able to predict the size of runs with remarkable accuracy half a year ahead, basing its judgment in part on the number of precocious males—jacks, they are called—which come to the spawning grounds a year early. But, even with good prognoses, orders often have to be changed in light of fishing tests which determine day of arrival, quantity and race of salmon present, weather conditions and the number and kind of boats actually fishing. Because of the speed with which the fishermen's planing-hull boats can get where the runs are, closures are sometimes necessary to prevent a whole run from being wiped out.

It has taken more than a quarter of a century of research and scientific regulation plus the installation

Where man and nature have blocked the migration routes, sophisticated fish ladders have been built. Here Hell's Gate fishways (right, far left) lead upriver.

Jumping clear of rapids, this sockeye gains on the turbulent current. Fish don't eat during their weeks-long migration, but live on body-stored fats.

Choosing her spot in a shallow stream's gravel, the female digs a nest—or redd—with her tail. She may lay as many as 5,000 eggs within 48 hours.

A hook-nosed, hump-backed male ripples the surface while he fertilizes the eggs of his mate with sperm-rich milt. Gravel will soon cover the redd.

of the Hell's Gate fishways for the Fraser sockeye to build back to merely a third of their number before man's carelessness intervened.

After the salmon enter the Fraser, they become sexually mature. In the fresh water they take on festive hues for the mating ritual, their bodies carnelian red, their heads green. The male has acquired a dorsal hump, a black snout and a mouth full of teeth, to defend the redd, or nest, the female will carve out.

In the Fraser, launching their bodies through the air to gain on the current beneath them, they average 20 miles a day to come at last to the riverbed where their parents died after spawning and which will now be their own deathbed. They have not eaten; their bodies are stripped of all stored fat. They have become only bearers of seed. When the sockeye enter the spawning grounds, some 18 days of life lie ahead.

Like red sashes trailing in the water, the schools of salmon hold near the entrance to the spawning ground while the eggs ripen within the female. Then, after pairing, the female chooses a space on the gravel where she will deposit her eggs. The gravel must not be too fine for oxygen-bearing water to diffuse through to the eggs; an assured volume and temperature of water should flow above it.

Having selected the place for the redd, the female literally wears her tail to the nub as she uses it to scour out a three-foot wide hollow some 12 inches deep in the stream bed. Into this she deposits part of her eggs as the male comes to her side to eject his sperm-laden milt. Then, moving upstream a few inches, she scoops a fresh area within the redd for another deposition of eggs. The loosened sand and gravel slip protectively over the orange-colored eggs that have been fertilized. For 48 hours the spawning continues while the female deposits 3,500 to 5,000 eggs.

Artificial channels and ten times the fry

To increase production, the Commission has tried various artificial aids. Recently and with good results, as at Cultus Lake, it planted eggs in experimental incubation channels.

Now the Commission is installing full-scale artificial spawning channels which give remarkable results. Spawning salmon are diverted from the natural streams into nearby engineered channels. In them the gravel is of optimum sizes to permit maximum permeation of oxygen-rich water which is controlled to assure steady flow and temperature. The artificial spawning channels are producing an egg-to-fry survival rate ten times that in natural rivers or streams. Through these artificial aids, weakened races can be more quickly restored. Given construction of enough of these artificial channels the time might soon come

when there would be more Fraser sockeye than at any time in recorded history. The only limiting factor might be the capacity of the rearing lakes downstream to care for the young salmon heading for the sea.

I went to the Adams River last October because it has the greatest of the restored Fraser River runs. The market price of sockeye spawned in the Adams and Little Rivers is such that their 305 acres of breeding beds are worth half-a-million dollars an acre.

This is the more remarkable because the Adams River race experienced not only the Hell's Gate disaster but another even earlier one which had made the upper river barren. In 1908, at the outlet of Adams Lake, a logging operation established a splash dam which for several successive years held the logs in the lake until, when enough were accumulated, they were flash-flooded down the Adams. Scouring, they dug up the gravel in the river and so destroyed the newly hatched alevins beneath its protective shield.

A final trip through the gauntlet

The route to the Adams River spawning area is the Trans-Canada Highway Number One from the Pacific past the industrial installations contiguous to burgeoning Vancouver to Shuswap Lake, surrounded by the camps of fishermen. All along the route are signs of progress for man and danger for the salmon.

Mountains rise on either side of the highway, sometimes close, sometimes beyond a wide valley. Tunnels through otherwise impassable slopes and occasional concrete walls protect man's passage from landslides as the covered fishways do for the fish. Far below the highway the murky Fraser and then the clear green Thompson shift from left to right and back through ravines where erosion can mean silting. Long freight trains, dwarfed into toy size by the mountains, follow winding defoliated roadbeds and disappear. Towers for high power lines march over peaks and through valleys, their way swept clear with herbicides. Logging roads furrowed across the mountain faces leave a trail of potential erosion to logging camps where valuable trees, cut into 30-foot lengths, start their journey by water to sawmills. Uncontrolled log drives can tear up the best of salmon beds. The slash left behind can drift dangerously downstream, perhaps to blanket the spawning gravel and smother incubating salmon eggs, or, piling up in a curve, change the stream's flow and destroy the bank's stability.

In the Thompson gorge, Indians with the rhythm of paddlers dip their nets into swirling currents to throw an occasional sockeye up onto the rocks, fishing the salmon in fresh water as they have always done and as they alone are permitted to do.

At Kamloops where the south and north arms of the

Taking vital oxygen from the stream, healthy eggs develop eyes in four to six weeks. Light-colored eggs seen here are dead from exposure to the sun.

Free-swimming fry leave the nest during the first spring of their lives, spend the next year in rearing ponds and then migrate downriver to the Pacific.

Man-made spawning channels, such as this at Gates Creek, provide optimum gravel and water conditions to help restore depleted populations.

Thompson go their separate ways, white steam from one of the Fraser's four new pulp mills fills the valley like a benediction. This pulp mill with its efficient waste-disposal system is a compatible neighbor to salmon and to man.

Beyond is the seven-and-one-half-mile-long Adams River, more accessible than many of the other major spawning grounds. Because of its fabulous productivity the Adams River run attracts thousands of people every major-cycle year. Amateur as well as professional photographers attempt the perfect shot. During the five days of officially sponsored "Salute to the Sockeye," whole busloads of schoolchildren are disgorged from yellow buses to follow the marked trail along the river. Politicians, representatives of the salmon industry and officials of the Commission have their say in the big blue tent erected for the occasion.

At four rough-hewn lumber stands, members of the churches and service clubs raise money for their projects by selling hot dogs, hamburgers and cold drinks. There's a show-business atmosphere, and rightly so. This is the Commission's big show; support for its work and cooperation of the many interests along the Fraser's streams (and of the Americans across the border) depend on an informed citizenry. Educational movies and displays in the tent supplement and explain the rich-hued scene being enacted a hundred yards away. Those who wish to may wander farther upstream or down and ponder the elemental drama of life that is played out by the spawning salmon. Within a week of spawning, drained of life and color, both the male and female salmon die.

The male usually slips away first. The female digs her fins into the gravel to keep her body protectively above the redd as long as possible. Unfertilized eggs drift downstream, opaque and pale, and are met by herring gulls that have flown inland for the feast.

In several weeks the eggs in the redd develop big eyes, and, in February, under the coarse gravel, they hatch into strange little alevins still attached to the eggs' orange yolk sacs which contain a completely balanced diet of proteins, carbohydrates, vitamins and minerals. Running along the outer surface of the sac is a vitelline vein which picks up oxygen from the water. Thus supplied with food and protected from predators by the gravel, the alevins need only a good flow of oxygen-laden water to survive.

Then on a moonless night in May or June, under cover of darkness, inch-long defenseless fry, the yolk sac absorbed, wriggle up through the gravel and make their way downstream to a rearing lake where they will remain a year. During spring freshets twelve months later the three-inch long fingerlings leave the rearing pond and are swept downstream, coursing through to the sea more easily if the water is high and obstructing rocks covered.

After becoming acclimatized to salt water in the estuary, the smolts leave for the open sea, not to return until their appointment with life, and with death.

Having survived the upriver trek, fought off rivals and mated for two days, this sockeye male is dying just hours after spawning near his birthplace.

By Francis E. Wylie

Pilgrims elude a Pilgrim-hunter

James Deetz, one of archaeology's new breed, seeks artifacts and laws of behavior in colonial trash heaps and cemeteries

"Maybe there never were any Pilgrims. Maybe the *Mayflower* story is just a legend."

Dr. James Deetz was expressing in his wry way the frustration of months of digging during the hot Massachusetts summer without finding any traces of the first settlers. In fact, Deetz has recovered thousands of artifacts from the rich trash heaps of the last three centuries, but nothing that can be positively identified with the 50 years before.

Last July Deetz and a group of student volunteers were at a site in the center of Plymouth, just behind a shoe store which occupies a house built in the early 18th century. The site probably marked the northern side of the Pilgrims' first village. Deetz thought there was just a chance the diggers would uncover evidence of the log stockade built around the village. Post holes, perhaps. A volunteer dug the soil from around the rotted stumps of three cedar posts.

"Could this be it?"

"If it is, we still have to find some proof," said Deetz, following the archaeologist's rule to be skeptical about anything he turns up. "Cedar lasts a long time, but these could have been the posts for a lady's clothesline 50 years ago."

The question was answered in a few days. In further digging the bottom of the posts was reached, and beneath one of them was a fragment of Mocha pottery.

"At the very earliest, 1790," Deetz said. "We can't tell how old the posts are, but we can be sure the Pilgrims didn't put them there."

A few days later the diggers gave up and shoveled back the dirt they had so carefully sifted. They had found Indian arrowheads, possibly contemporary with the Pilgrims. They were able to piece together much of a fragile Whieldon ware teapot, which could be dated to 1760, and they glued together 36 pieces of a handsome English agateware bowl of the same date (see p. 39). Shattered chamber pots were harvested in abundance, particularly creamware ones of about 1800. In fact, the excavation produced a remarkable cross section of New England culture, from clay pipes and pewter spoons to modern alarm clock remnants. But no Pilgrim artifacts.

Deetz (left), Geoff Moran (right) and a youthful band of volunteers dug last summer for the home of Governor Winslow—and they found a barn.

Nonetheless, the cross section is important to Deetz, one of the leaders of a new breed of investigators who are as much anthropologists as archaeologists. While archaeologists have always sought to make inferences from what they find, their work in the past has tended to be merely descriptive. Deetz and other practitioners of what is sometimes called the New Archaeology would like, through rigorous scientific method, to develop unifying theory and basic laws explaining the behavior of Man in all ages.

A pioneer of this approach, Deetz did not start out as an archaeologist. He wanted to be a doctor until, at Harvard university, he failed chemistry and

Mr. Wylie, whose article on Ali Javan and the gas laser appeared in April's SMITHSONIAN, *is with the Boston University Medical Center.*

On his Victorian porch in Plymouth, Deetz and his wife gather with their eight children. On Friday nights, the population often swells.

switched to anthropology. After his sophomore year, he went to South Dakota for a summer of salvage archaeology, digging Indian sites which were about to be covered by dammed-up water.

It was during a subsequent trip to South Dakota that Deetz made a remarkable find: While digging, he saw something brown and shiny gleaming in the dirt. "Hey, what's this?" he yelled, and colleagues gathered around him. He carefully brushed away the soil and unearthed his own polished shoe. He again returned to that state for his doctoral thesis work. By rigorous computer analysis of potshards from an Arikara Indian site, he demonstrated three distinct cultural phases between 1700 and 1780. He showed how, under the impact of trade in guns and horses and of the white man's smallpox, a stable society quickly altered to one of great mobility and small units.

He became a professor at the University of California at Santa Barbara, but summer fieldwork brought him back to New England. He recalls that he set out in 1965 in a Ford station wagon with his wife, eight children, one babysitter and 140 reptiles and amphibians. A consignment of 16 cats—two mothers and their litters—had been flown ahead, as well as cages containing additional lizards, including a three-foot iguana.

All went well in the station wagon until, after a 900-mile day, they discovered that a king snake had escaped and eaten 30 lizards. "He looked like a Christmas stocking," says Deetz.

In contrast to the unstratified and exuberant chaos of Deetz's mobile household, his precise archaeological method was sharpened in the summers of 1965 and 1966. Without digging so much as a spoonful of dirt, Deetz and a Harvard student, Edwin Dethlefsen, studied the carvings in over 20,000 tombstones in southern New England cemeteries. They traced the evolution of a grim death's head motif into a relatively cheerful cherub, correlating the change with the transition from stern Calvinistic doctrine to a theology in which the Resurrection played a more conspicuous part. His "archaeological" inferences could in turn be confirmed by written records of the time, serving to prove the validity of the archaeological method. His most exciting moment was "sitting in a Concord cemetery and suddenly realizing that all those gravestones made sense."

By 1967, Deetz had decided he was a New Englander, not a Californian. He resigned from Santa Barbara, driven also by the failure of the protest movement there. He had been on a faculty-student committee which organized the first protest march on the state capitol after the firing of Clark Kerr. A television network collected a group of bearded, wild-looking kids and made pictures of them pouring out of the dormitories. They appeared on national television as well as the 5,000 soberly dressed and legitimate protestors marching on Sacramento. "I decided to give it up," says Deetz, "because one, it doesn't do any good, and two, no matter how hard you try they're going to mess you up."

In answer to activists, who say his archaeology is an escape from the important things in the world, Deetz replies: "That's a lot of nonsense. We can't have social

change until we understand what we are, and we can't understand that until we understand where we come from. More than any other generation, the kids today are interested in history, and what we are doing is to help them understand the past."

Deetz became professor of anthropology at Brown University and assistant director of the Plimouth Plantation at Plymouth, Massachusetts. A re-creation of the original Pilgrim village, Plimouth Plantation was organized principally by a serious amateur archaeologist and successful businessman, Henry Hornblower II. In addition to the village, the organization built the ocean-going *Mayflower II* and has sponsored archaeological research into the colonial past. Authenticity was a key word in the venture, and Deetz was looked to as a scholar who could help provide it.

Pottery and barns but no turkey bones

At 41, Jim Deetz is exuberant and animated. His blond curly hair is shaggy, and he wears snug, belled trousers on his lean hips, like the young people with whom he works. Wherever he goes, he is surrounded by admiring youngsters who dig for days on end without pay and without college credit, in a common acceptance with Deetz of modest scholarly goals.

"No one really knows what the Pilgrims were like," he says. "There are valuable written records, to be sure, and some of the furniture and weapons have survived. But in more than three centuries a lot of legend and folklore have accumulated, and no one knows how much of it is true.

"Through digging in the ground where they lived we believe we can learn a great deal more—not only about the Pilgrims but about the evolution of American society and culture since then."

Thus far, some 100,000 pieces of colonial pottery and other artifacts have been uncovered, but no momentous conclusions have yet been reached. There is evidence that while the Pilgrims were all equal to begin with, Plymouth society was distinctly stratified by 1700. And Deetz observes that in spite of the Thanksgiving tradition no turkey bones have been found.

A year ago Plimouth Plantation and the National Park Service sponsored a major Deetz excavation at the site of a tavern on Great Island in Wellfleet Harbor on Cape Cod, where whalers apparently made their headquarters between 1690 and 1740.

In midsummer this year another Deetz crew started digging in Marshfield, a dozen miles north of Plymouth, for debris left by Edward Winslow, a *Mayflower* passenger who settled there about 1635 and later served as governor of the colony, as did his son Josiah.

In 1941, Henry Hornblower conducted an excavation on the Winslow lands and found the foundation of a house built in about 1650. Two years ago two amateurs did some digging in the same general area. They wouldn't reveal where, which is the sort of thing that makes an archaeologist climb a wall, but Deetz saw some of their finds and, he says, "They were getting some real jazzy stuff."

So he decided to make a try at the Hornblower site. The dig's director was Geoffrey Moran, a history teacher at Bradford Junior College. The crew varied from day to day, but there were some regulars, including Barbara Haines, a rosy-cheeked blond from Pembroke College, who has been attracted to archaeology ever since she took a course under Deetz at Brown. (There were about 500 in the class—quite large for Brown but proof of his popularity. "I would always sit in one of the front rows because I didn't want to miss anything," Barbara remembers. "He has a habit of making comments aside, almost to himself, in a low voice—like 'I guess I'd better try that sentence again. I confused everyone.' The next year I went back to visit the class and he said, 'Hey, what are you doing here?' He remembered me as a person.")

The early days of digging for the Winslow house were not very rewarding. There were small mounds of

Deetz and Geoff Moran (left) confer above what was the corner of an early house, but the other three corners evaded detection.

Within the precisely marked squares at the Winslow site, what might have been a posthole dug by Pilgrims turned out to be a dead end.

crumbled brick—"soft as peanut butter," as Deetz put it, and obviously very old. There were some small pieces of a black glazed ware commonly used in 17th-century England but rarely found in America. As the string-marked squares were extended and the excavation deepened, prospects became more promising.

Some 18 inches below the surface dark bands of earth began to show against the yellow sand and clay. They looked as though they marked the foundations of buildings. Stones large enough to serve as foundations are not native to this shore area of Marshfield and would have had to be carted from elsewhere. Since such stones would have a value, they could have been dug from the original trenches and used for the foundations of new structures. Topsoil would wash into the trenches, accounting for the dark bands.

The diggers followed one band for 80 feet, where it turned a precise right angle—clearly the corner of a building. If three other corners could be found the complete dimensions would be established. But 80 feet! "We believe the Pilgrims may have had houses 30 or 40 feet long, built in three bays about ten feet square," explained Deetz. "There is evidence of such houses, although previously Pilgrim homes were supposed to be much smaller. A building 80 feet long would have to be a barn. And we believe there were such barns—funny looking buildings, long and low."

The excavation was extended in other directions, and after a few days Deetz came back for an inspection. Moran handed him an odd assortment of objects taken from a new hole—some rusted wire nails, a corroded brass cotter pin and a curious little glass tube about an inch long, containing a clear fluid.

"What in the hell is that?" exclaimed Deetz. They finally determined that it was the bubble chamber from a carpenter's level, the wooden frame of which had rotted away. Wire nails, cotter pin and such an artifact certainly didn't belong to the Pilgrims, even though they were found at a depth in the soil indicating the right age.

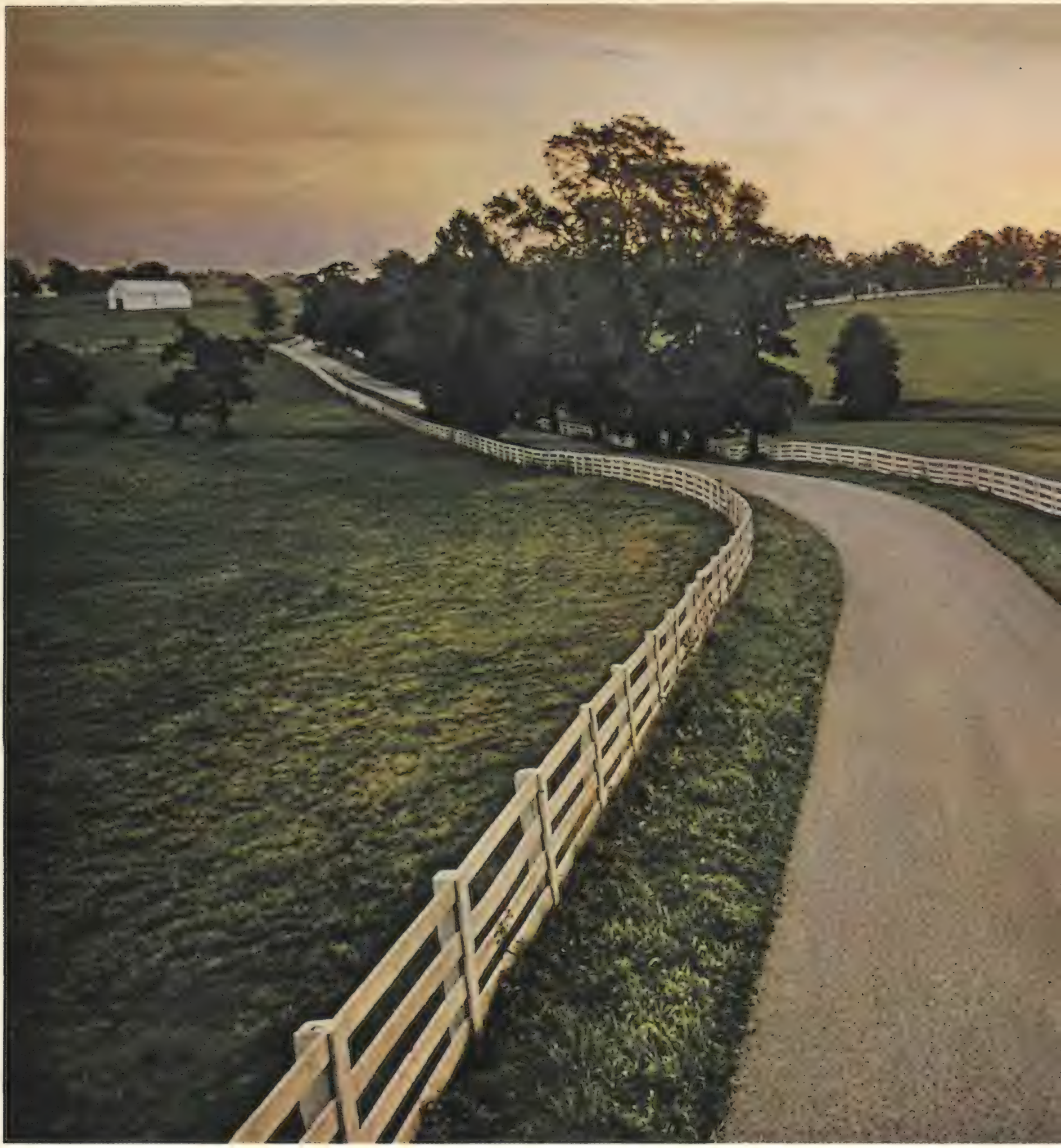
Further digging failed to reveal the other corners of the building or anything else of special value, and in another week the site was abandoned. But there were other projects to undertake; the exuberant Deetz was not discouraged. He and his band would continue their search elsewhere for remains of the Pilgrims. And meanwhile, he continues to perfect his analytical methods and to seek broad anthropological conclusions from those artifacts they do dig up.

Digging, of course, is only the beginning of the job. Every shard and scrap from an excavation is carefully numbered, showing the exact position of discovery. Bags of material are taken back to the Plimouth Plantation laboratory for careful study. Students work for hours and days trying to fit together jagged pieces of pottery, often gluing together recognizable and even beautiful reconstructions of the original ware. The bore of every clay pipestem fragment, of which there are bushels, is measured. (Between 1590 and 1800 the bore became 1/64 of an inch smaller every 30 years and pipestems serve as reliable indicators of the age of associated artifacts.)

However productive of theory his research may prove to be, it is very productive of artifacts and students. Plimouth Plantation now has one of the largest collections of 17th-century artifacts, surpassed, perhaps, only by that at Jamestown, Virginia. And the students who have worked with Deetz now number in the hundreds. On Friday nights they are likely to gather at his house to celebrate the end of a week's work. The house is a big gray Victorian summer place a half-mile from Plimouth Plantation.

Some of the college students who spend the day in gray Pilgrim garb, as inhabitants of Plimouth Plantation, show up in the quaint costumes of the 1971 youth culture. A record player blares with Bluegrass music, the staple in the Deetz household. When it stops, Deetz yells, "Where's the music? It's too damned quiet here." Traffic to the kitchen increases, where a makeshift bar offers everything from milk to Scotch. Tomorrow is Saturday and artifacts can wait.

Pitchers, pipes, bowls and chamber pots from colonial settlements await laboratory analysis outside the reconstructed Pilgrim village at Plimouth Plantation.



As you can see,

They're underground. Pretty soon almost all our telephone lines will look this good.

We think America has enough eyesores without adding any more. So wherever possible, we're burying our new cable. And converting our old aerial lines.

Right now, we already have over 50% of our telephone lines nicely hidden underground. And before we're through, we'll have about 92% of them out of sight.

We'll never reach 100% for two reasons: in a few places it's practically impossible to get the cable underground. In a few other places it's possible to get the cable underground, but it's ridiculously expensive.

We'd like to point out, by the way, that burying cable isn't something new at General Telephone. We've been

730 Third Ave., N.Y., N.Y. 10017

you can't see our new telephone lines.

doing it extensively since 1955—long before environment and ecology became household words.

In those 16 years we've gone through hills and high water and turnpikes and mountains to get our telephone cable underground.

We've struck oil in Texas (a pipe in someone's backyard). We've even had to get a special repellent to keep gophers from feasting happily on our cables.

So while you may still see a fair number of telephone poles around, bear with us. We're working as fast as we can to bury our lines.

And resurrect our scenery. GTE

GENERAL TELEPHONE & ELECTRONICS

By E. John Bullard

The lively humor and warmth of John Sloan's art

Seen in a centennial show at the National Gallery, this important realist's style looks as fresh and alive as his subjects were

The American artist John Sloan died 20 years ago, just before the triumph of Abstract Expressionism. Although never an abstractionist himself, he is in a curious way a beneficiary of that movement and of the succession of Pop, Op, Minimal and what-have-you that established this country as the international leader in contemporary art. This international recognition has had the effect of triggering a reexamination of *all* American art, creating a new esthetic—not to mention commercial—appreciation of our own heritage.

This was certainly not the situation at the end of the 19th century when Sloan began his artistic career. Paris, with its prestigious Academy and Salon, was then the leading art center, attracting students from all over Europe and America. Practically self-taught, preferring to stay at home, John Sloan rejected the notion of French superiority and set out to create a distinctively American art in both subject and style.

How well he succeeded should be evident to all in this centennial year of his birth, when public and critics will have an opportunity to examine afresh the complete range of this important American realist's career. Two events have already called it to attention. On August 2, the artist's birthday, the Postal Service issued a commemorative stamp reproducing his widely known *Wake of the Ferry*. And on September 18

E. John Bullard is Curator of Special Projects at the National Gallery. He organized the John Sloan exhibition and is co-author of the catalog.

The City from Greenwich Village, oil (1922)—a view over the old Sixth Avenue "El" to lower Manhattan.

National Gallery of Art, gift of Helen Farr Sloan

Archives of American Art, Smithsonian Institution

John Sloan photographed about 1896 beneath what appears to be a caricature of himself.

Collection John Sloan Trust

Find the hidden football player: a puzzle in Sloan's poster style from the *Philadelphia Press* (1901).

the most comprehensive exhibition of his work ever held opened at the National Gallery in Washington, where it will be on view until the end of October. After that it will travel to Athens, Georgia, and to San Francisco, St. Louis, Columbus and Philadelphia.

Sloan was born in the small central Pennsylvania town of Lock Haven and was raised in Philadelphia. His father's failures in both health and business forced him to drop out of high school in his next to last year, so he got a job with Porter & Coates, then Philadelphia's leading bookseller and print dealer. There he was able to study and copy prints by Dürer and Rembrandt, which inspired him to learn for himself the technique of etching.

Three years later, in 1890, he launched out on a career as a commercial artist, designing calendars and illustrating gift books for a local novelty company. The following year Sloan set himself up as an independent free-lance artist who did lettering and created advertisements. His best client was a Philadelphia coal company for which, every month, he designed a streetcar poster advertising the firm's product (with which, in the winter, he was sometimes paid).

For Sloan, 1892 was a crucial year. Seeking steadier work, he joined the staff of the *Philadelphia Inquirer,* where he was assigned to illustrate stories for the newspaper's feature pages and Sunday edition. In the fall he enrolled in the evening antique-drawing class at the Pennsylvania Academy of the Fine Arts, then America's best art school.

A leader is acquired

During this period Sloan met Robert Henri, just returned from study abroad and at the beginning of his long career as a teacher of art. Some of the newspaper artists and Academy students began meeting regularly in Henri's studio; they included, besides Sloan, William Glackens, George Luks and Everett Shinn (see article on Edward Hopper in SMITHSONIAN, September 1971). Henri became their leader, introducing them to the new European trends in painting and literature and encouraging them in their work.

Although he had been painting sporadically when he met Henri, Sloan was devoting most of his time to his newspaper work. From the beginning his illustrations were done in a personal variation of the so-called Poster Style, a manifestation of Art Nouveau that derives its name from the thousands of posters created in Europe and America toward the end of the 19th century. He did hundreds of black-and-white illustrations in this manner for the *Inquirer* and, after 1895, for the *Philadelphia Press.* Sloan enjoyed working for the newspapers, especially the *Press,* which was then one of the country's best. Recalling those days, he wrote:

Hairdresser's Window, oil (1907). This is typical of Sloan's authentic scenes of urban life.

Wadsworth Atheneum, Hartford: The Ella Gallup Sumner and Mary Catlin Sumner Collection

Twin Lights—Purple Rocks, oil (1915). Painted at Gloucester, it shows the influence of Van Gogh.

Collection John Sloan Trust

"It is not hard to recall the *Press* 'art department': a dusty room with windows on Chestnut and Seventh Street—walls plastered with caricatures of our friends and ourselves, a worn board floor, old chairs and tables close together, 'no smoking' signs and the heavy smell of tobacco. . . . But we were as happy a group as could be found and the fun we had took the place of college for me."

Encouraged by Robert Henri, Sloan began to paint seriously about 1896—first portraits and, later, scenes of Philadelphia. These were done in the somber gray-brown tones of Henri's own work, and showed their mutual interest in Whistler and the early Manet.

Sloan began to exhibit these oils in 1900. At that time the possibilities open to American artists were severely limited: Success in the various academy annuals was a prerequisite for obtaining one-man shows in the private galleries. While Sloan was regularly included in the annual exhibitions of the Carnegie Institute, the Pennsylvania Academy and the National Academy of Design, his work—like that of his friends—met with general indifference and often hostility. The academicians objected to their robust depictions of city life, which they considered vulgar, and to their dark colors and vigorous brushwork, which they found slipshod.

Sloan and Henri led the fight against these stultifying academic traditions and for wider, more liberal exhibition opportunities. They started showing their work in a series of group exhibitions in New York, where it was seen to better advantage than in the academy annuals. The most famous was the one held in February 1908 at the Macbeth Gallery. Known ever since as "The Eight," the group included Sloan, Henri, Glackens, Luks and Shinn, plus their friends Ernest Lawson, Maurice Prendergast and Arthur B. Davies. The show caused the usual uproar among the academicians and the conservative critics, who used such epithets as "apostles of ugliness" and "the revolutionary gang," but in attendance and sales it was a success.

Dust Storm, Fifth Avenue, oil (1906). This spirited work is the first painting Sloan sold to a museum.

Metropolitan Museum of Art, George A. Hearn Fund, 1921

Unfortunately, despite all his efforts to expand exhibition opportunities for others, Sloan was the least commercially successful of The Eight. He did not sell a painting until 1913. By 1921 he had still sold fewer than ten paintings, and his etchings attracted only a limited market. It was not until the early 1940s, when he was over 70, that Sloan was able to live off the sale of his work.

Nevertheless Sloan loved New York. It inspired many of his best illustrations and some of his finest etchings and paintings. He spent hours walking the streets of the city, especially in lower Manhattan, observing the life about him and looking for subjects.

One of his most beautiful early paintings, *Dust Storm, Fifth Avenue* (above), was the result of such observation. In his diary for June 10, 1906, he wrote: "In the afternoon, walking on Fifth Avenue, we were on the edge of a beautiful wind storm, the air full of dust and a sort of panicky terror in all the living things. . . . A broad gray curtain of cloud pushing over the zenith, the streets in wicked, dusty murk." The following year, walking to Henri's studio, he observed "a humorous sight of interest. A window, low, second story, bleached blond hairdresser bleaching the hair of a client. A small interested crowd about." This incident was recorded in the canvas of *The Hairdresser's Window* (page 45).

These scenes of New York were painted in his studio from memory. Sloan rarely sketched his subject on the spot, but worked instead directly on the canvas without preliminary drawing. He painted with little attention to detail or interest in a high degree of surface finish. But his technique is as fresh and alive as the subjects themselves were. The other realist painters around Henri, who depicted similar subjects, were never able to capture the same natural humor and genuine feeling of the city and its inhabitants.

Sloan's interest in the city and its people led him into the Progressive movement, which was then attempting to correct the excesses of the trusts and

monopolies and create a new social awareness in the American public. He was not really a politically oriented person, but was, rather, a genuine humanitarian, indifferent to doctrinaire questions. In 1908 he started to contribute cartoons and illustrations to various socialist publications, and eventually joined the Socialist party.

The most important result of this commitment was Sloan's art editorship of *The Masses,* which he took on in 1912. Because it did not follow a strict socialist line, it had a broader readership than other Progressive magazines. As art editor, a job for which he was not paid, Sloan completely redesigned *The Masses;* he simplified the layout, used a single typeface throughout, and made the illustrations as big as possible.

His clean, direct approach to graphic design was a fresh innovation in American publishing, and it had a direct impact on other magazines—*Harper's Weekly* in particular. But with the advent of World War I the editorial policy of *The Masses* grew more rigidly doctrinaire, and Sloan became disenchanted with the magazine and the Party. In 1916 he resigned from both. Except for occasional assignments, that was also the end of his career as a magazine illustrator; thereafter he supported himself by teaching, principally at the Art Students League in New York.

After the Armory Show of 1913, Sloan began to refocus his artistic goals. Up to that time he had seen little modern European painting, but the work of the postimpressionists and cubists he had seen at the Armory had a strong effect on both his future choice of subjects and his technique. The first result of these new interests was a series of pure landscapes painted directly from nature in Gloucester. The influence of Van Gogh is particularly evident in these powerful studies of rocks and sea, such as the *Twin Lights—Purple Rocks* painted in 1915 (page 46), both in the bright, intense color and the calligraphic brushwork.

In the summer of 1919 Sloan visited New Mexico. Overwhelmed by the austere beauty of the desert, he bought a house in Santa Fe the following year and spent all but two of his summers there until his death in 1951. The Southwest provided him with entirely new subject matter: Not only did he paint desert and mountain landscapes, he depicted scenes of Spanish-American and Indian life with the same insight and sympathy he brought to his city paintings.

But the major change in his work was a newfound interest in depicting the female nude. This was partly a result of his work at the Art Students League, where his pupils worked from a model, but it was also inspired by the late paintings of Renoir, in which the Frenchman abandoned impressionism for a technique that could convey the solidity and monumentality of the human form. Sloan did continue to paint the city, but his view of it broadened in the twenties; he is concerned less with people and more with the spectacle of the city itself. *The City from Greenwich Village* (pages 42-43) displays this new direction, with its panoramic view, complex perspective and diminutive figures.

Painting as an experiment

As his interest in expressing the weight and solidity of forms increased, Sloan abandoned the pure oil technique in favor of monochrome, tempera underpainting covered with transparent color glazes. After 1930 he went a step further and started superimposing parallel lines and cross-hatching over the glazes to strengthen and emphasize the forms.

At their best, Sloan's cross-hatched nudes achieve a three-dimensional monumentality and unique sculptural presence. These sturdy, often awkward women lack grace and sex appeal but possess great energy and strength. As Sloan said, "I don't like a nude that looks too much like human flesh. I think it might better have a dry, hard look, be sculptured with color-textures like a piece of bronze." Often his cross-hatching technique was more effective in his later New York and Santa Fe scenes, such as *Monument in the Plaza* (opposite), where the small forms make the lines less obtrusive.

In view of his attempts to achieve three-dimensional, tactile qualities in his paintings, it is unfortunate that Sloan never tried his hand at sculpture, which would seem to be the natural extension of his experiments. Critics of these late works, who can accept total abstraction but complain of the "unnaturalness" of Sloan's cross-hatching, should remember his own words: "Works of art are made of wood and bronze and oil paint, not flesh and blood."

Monument in the Plaza, tempera with overglaze (1948-49):
Santa Fe portrayed in Sloan's cross-hatched style.

Collection John Sloan Trust

Back-up for the LM that put astronauts on the moon

This 23-foot-high lunar module, back-up vehicle for the first such craft to rocket into space with NASA's Apollo program, has come to rest in the Smithsonian's Arts and Industries Building. Only minor differences in on-board equipment distinguish it from the one Astronauts David Scott and James Irwin flew when they landed on the moon in July. Fully fueled, loaded and manned, the vehicle weighs 33,450 pounds on Earth. Bright bronze covering is aluminized plastic, much of it 25 layers thick, to protect against micrometeorites; silvery aluminum skin reflects heat and radiation, which the black nickel-steel skin absorbs. The topmost antenna is the rendezvous radar; below it are the VHF antenna (right) and the S-band move-

Smithsonian acquisition

able antenna (left). Chalice-shaped objects are attitude-control rocket nozzles. The ladder (center) leads to the egress platform and hatch; above that are the large tracking light and in-flight antenna. The ascent stage—everything above the platform—carries astronauts back to the orbiting command ship, using the descent stage as a launching platform.

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Sturbridge Village, Massachusetts: A Yankee winter weekend in the 18th-century atmosphere of this re-created village—January 21-23.

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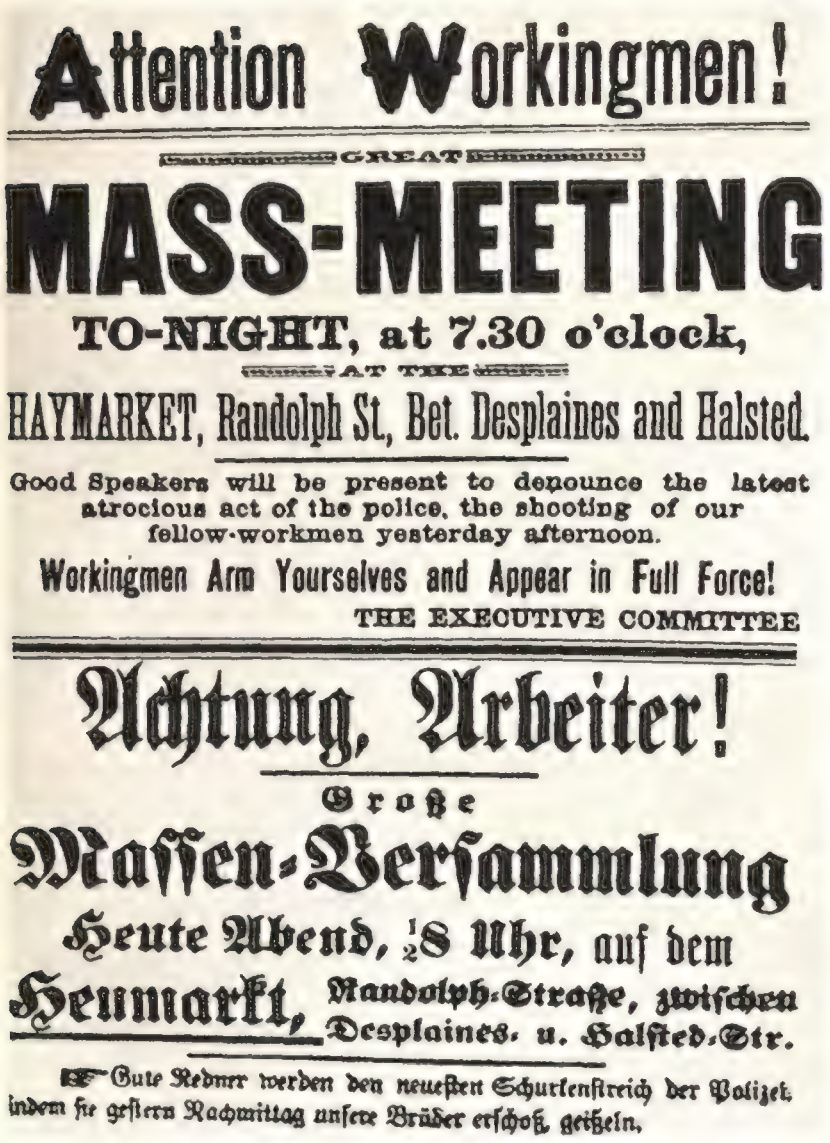
Death Valley National Monument: A look at geology, climate, history in this desert region—April 14-20.

By Richard Suskind

World shuddered as blood flowed in the Haymarket

The labor movement long suffered from a clash between radicals—mostly foreign-born—and Chicago's forces of law-and-order

Print shows anarchists haranguing as bomb blasts police. Actually, they had agreed to disperse.



Attention Workingmen!

GREAT

MASS-MEETING

TO-NIGHT, at 7.30 o'clock,

AT THE

HAYMARKET, Randolph St, Bet. Desplaines and Halsted.

Good Speakers will be present to denounce the latest atrocious act of the police, the shooting of our fellow-workmen yesterday afternoon.

Workingmen Arm Yourselves and Appear in Full Force!

THE EXECUTIVE COMMITTEE

Achtung, Arbeiter!

Große

Massen-Versammlung

Heute Abend, ½8 Uhr, auf dem Heumarkt, Randolph-Straße, zwischen Desplaines- u. Halsted-Str.

☞ Gute Redner werden den neuesten Schurkenstreich der Polizei, indem sie gestern Nachmittag unsere Brüder erschoß, geißeln.

Copyright © 1971 by Richard Suskind

"A year ago, we blew away the Haymarket pig statue at the start of a youth riot in Chicago. Last night we destroyed the pig again." (Taped message from Weatherman faction of SDS, *Newsweek*, Oct. 19, 1970.)

At ten P.M. on Tuesday, May 4, 1886, a crowd of about 1,200 working men, most of them German immigrants, was gathered near a truck wagon in a blind alley just north of Haymarket Square, Chicago (poster, left). For the past two hours they had been listening to speakers on the wagon, all of them well-known radicals, denounce "the latest atrocious act of the police"—the killing of one man and the wounding of several others in a clash between police and strikers outside the McCormick Harvester plant on the previous afternoon. So far they had been addressed by August Spies, editor of the *Arbeiter-Zeitung* (Worker's Journal), a German-language anarchist daily, and by Albert Parsons, editor of *Alarm*, another anarchist periodical. Both men had made fiery, inflammatory speeches. Now the

Mr. Suskind's book, By Bullet, Bomb and Dagger: The Story of Anarchy, *from which this is excerpted, will be published by MacMillan later this month.*

crowd was listening to Samuel Fielden, an executive of the International Working People's Association, an anarchist organization.

"The skirmish lines have met. People have been shot. Men, women and children have not been spared by the capitalists. . . . Any animal, however loathsome, will resist when stepped upon. Are men less than snails and worms?"

In the brief silence that followed, the tramp of marching feet was heard, and a column of about 180 police, came swiftly across the square and up to the wagon. "In the name of the people of the State of Illinois," said Captain Ward in a loud voice, "I command this meeting immediately and peaceably to disperse."

"We are peaceable," Fielden replied and, followed by Spies and Parsons, began to climb down from the wagon. At that moment, from somewhere on the edge of the crowd, a round, sputtering object hurtled through the air, landed near the first rank of police and went off with a flash and a roar. Patrolman Mathias J. Degan was killed instantly, six officers were fatally wounded, and about 60 others received injuries.

There was a moment of horrified silence following the explosion. Then, growling with rage, the police closed ranks and charged, firing their revolvers into the fleeing crowd, killing and wounding an unknown number (estimates vary between five and 60, with the higher number the more probable). Within seconds, except for the dead and wounded, the square was empty. The "Haymarket Riot" was over, and the "Haymarket Affair"—America's first anarchist drama —was under way.

The bombing was the culmination of weeks of rising tension, during which workers throughout the country had agitated, sometimes violently, for an eight-hour day. It was widely believed that the "Reds" had launched their long-threatened revolution and that other acts of violence would soon follow. The press, with hardly an exception, blamed the workers. The *Chicago Tribune* called them "the offscourings of Europe . . . vipers, ungrateful hyenas, serpents." Responsible citizens were heard to say that the "Reds should be hanged first and tried afterward." Prosperous businessmen formed armed bands of vigilantes and prepared for house-to-house combat. The First Infantry Regiment was alerted. The police, hunting frantically for the man who had thrown the bomb, filled the jails with more than 200 known radicals, the

"I command peace," says this constable at the Haymarket. Weathermen boast that they twice bombed the "pig statue" (quote, opposite page).

Another illustration shows Chicago's finest "charging the murderous rioters" and gunning down many of them—perhaps as many as 60.

majority of whom had not even been at the meeting.

Eight of the arrested men, among them Spies, Parsons and Fielden, were charged with being accessories before the fact to murder by means of a bomb, with murder by pistol shots and with general conspiracy to murder. Except for Parsons, a "real" American who had fought for the Confederacy in the Civil War and whose ancestors had come on the *Mayflower,* and for the Englishman, Fielden, the accused were all either German-born or of German descent.

The prosecution's prize defendant was Louis Lingg, a 22-year-old carpenter who had emigrated from Germany the year before. Lingg was a fanatical anarchist, a skilled bomb-maker who admitted delivering a trunk containing 50 of his homemade dynamite bombs to Neff's Hall, a meeting place for radicals, on the morning of May 4. It was probably one of these bombs that was thrown in Haymarket Square. But it was not thrown by Lingg, for he was miles away at the time of the explosion. The actual bomb-thrower, in fact, was never found.

The trial opened on June 21 and continued throughout the summer. Prosecutor Julius S. Grinnell set the tone with his opening speech to the jury: "The firing upon Fort Sumter was a terrible thing to our country, but it was open warfare. I think it was nothing compared with this insidious, infamous plot to ruin our laws and our country secretly and in this cowardly way. . . ." Basing his case primarily on ill-defined and still much-disputed "conspiracy laws," Grinnell

had no difficulty in proving that all the defendants had at one time or another advocated the violent overthrow of the government.

On August 20 the jury retired. Three hours later they brought in their verdict: Seven of the accused were found guilty of murder and the penalty fixed at death; one, a tinsmith named Oscar Neebe, whose crime consisted of the possession of a pistol, a sword, a red flag and two dollars worth of stock in the company which published the *Arbeiter-Zeitung,* but who had not been present at the Haymarket meeting, was found guilty of murder and the penalty fixed at 15 years in the penitentiary. The crowd in the packed courtroom and on the steps outside the building burst into spontaneous cheers when the verdict was announced, and immediately afterward Judge Joseph E. Gary went out to the corridor, where his wife was waiting, and said: "All is well, Mother. Seven to be hanged, and one 15 years. All is well."

Most Americans felt that justice had been done, that, even if none of the accused had personally thrown the bomb, they were guilty of being anarchists and that that alone merited death by hanging. The press was nearly unanimous in its praise of the verdict: THE SCAFFOLD WAITS—SEVEN DANGLING NOOSES FOR THE DYNAMITE FIENDS *(Chicago Tribune).*

Between October 7 and 9 the convicted men were allowed to state their reasons why sentence should not be pronounced. By far the most dramatic speech was the short one made by Louis Lingg.

"Court of Justice!" he began, his voice ringing with scorn. "With the same irony with which you have regarded my efforts to win, in this 'free land of America,' a livelihood such as humankind is worthy to enjoy, do you now, after condemning me to death, concede me the liberty of making a final speech. I accept your concession; but it is only for the purpose of exposing the injustice, the calumnies and the outrages which have been heaped upon me." He had not been convicted of murder, Lingg went on, but of being an anarchist, a charge which he admitted with pride. "I repeat," he thundered, "that I am the enemy of the 'order' of today, and I repeat that, with all my powers, as long as breath remains in me, I shall combat it. I declare again, frankly and openly, that I am in favor of using force. . . . I despise you. I despise your order, your laws, your force-propped authority. Hang me for it!"

The grim verdict pronounced

In a voice so weak that it was barely audible, Judge Gary pronounced sentence. "In substance and effect," he said, "it is that the defendant Neebe be imprisoned in the State Penitentiary at Joliet at hard labor for the term of 15 years. And that each of the other defendants, between the hours of ten o'clock in the forenoon and two o'clock in the afternoon of the third day of December next, in the manner provided by the statute of this State, be hung by the neck until he is dead. Remove the prisoners."

Excitement rose to its greatest pitch since the bombing itself as a new date of execution, November 11, 1887, drew near, and Governor Richard Oglesby had to decide whether to commute the sentences.

Theodore Roosevelt spoke for the majority when he said, "It is to the common interest of all Americans that the Chicago dynamiters be hung." But many prominent figures disagreed with him. George Francis Train, an extraordinary character who had taken part in the Marseilles Commune of 1870 (see SMITHSONIAN, March 1971) and had been a presidential candidate, said, "If it is absolutely essential that seven men hang, the American people could better afford to sacrifice the seven judges of the Illinois Supreme Court than the condemned."

Governor Oglesby was under great pressure from both sides. During October and the early part of November, he received an average of 500 letters a day, about half of them exhorting him to carry out the sentence and the other half asking him to show clemency. Parsons sent a note to the governor in which he asked for a short reprieve so that his wife and two children, who had been present at the Haymarket meeting, could be indicted, tried, convicted and put to death together with him. "My God, this is terrible!"

The characteristic pink pages of the *National Police Gazette* detail the bathos of the "last short day." Wives of the condemned appeal to the anguished

Oglesby exclaimed in horror when he read the note.

A sensational development took place on November 10, while the governor was still considering his decision. At nine o'clock that morning a muffled explosion rang out in the county jail. The guards rushed to Lingg's cell and found him lying on the floor with the lower half of his face blown away. Somehow (it was

Governor Oglesby (seen also in inset), and bid farewell to the doomed men. Militia stands by (lower left) as the death warrant is read (lower right).

never discovered how) he had obtained a detonating cap, put it between his teeth and lit the fuse with a candle-flame. He was taken immediately to the hospital, where he lingered until three P.M., conscious and in agony all the while, and then died.

Four hours later, in the state capitol of Springfield, Governor Oglesby announced his decision. He was commuting to life imprisonment the sentences of Fielden and Michael Schwab. Although he was convinced of their guilt, they had expressed contrition, begged for mercy and were essentially "good" persons at heart. He regretted that he could not say the same for the other prisoners. They would die on schedule.

At 11:30 the next morning, Spies, George Engel,

Adolph Fischer and Parsons had their arms pinioned, their wrists handcuffed, their bodies draped in white muslin shrouds (see p. 59) and were taken out to the gallows which had been erected in the courtyard of the county jail. The building was in a state of siege. To prevent any attempt at a last-minute rescue the block was surrounded by 300 police armed with bayoneted Winchesters, while sharpshooters occupied rooftops.

The condemned were all outwardly calm and composed. They mounted the scaffold with firm steps and took their places on the trap. Sheriff Matson and Jailer Folz adjusted the nooses about their necks and placed hoods on their heads; then they stepped back, and the sheriff grasped the rope that would release the trap. At the last moment the silence was broken by the voices of the four men crying out:

Spies: "There will come a time when our silence will be more powerful than the voices you strangle!"

Fischer: "Hurrah for anarchy! This is the happiest moment of my life!"

Engel: "Hurrah for anarchy!"

Parsons: "Let the voice of the people be heard!"

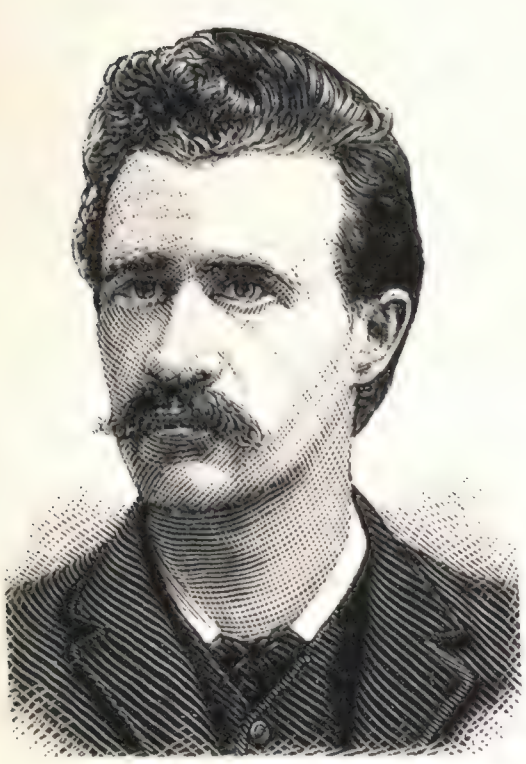
There was a crack as the trap sprang open, a concerted "Aaaaaaaaahh" from the audience as the shrouded figures plummeted through it. Then the only sound was the faint creaking of four taut ropes.

Following the executions, the Amnesty Association of Chicago turned its attention to obtaining pardons for Schwab, Fielden and Neebe. Nothing was accomplished until 1892, when John Peter Altgeld, the first Democrat to hold that office in 30 years, was elected governor of Illinois. Soon after, Altgeld began to study the 8,000 pages of testimony in the Haymarket trial. "If you go through that record," a friend warned, "you will see that you ought to pardon all three of them, and I hope you will. If you do, though, it will be the end of your political career."

"If I decide they were innocent," said Altgeld, "I will pardon them, by God, no matter what happens . . . !"

Altgeld, a lawyer and a judge before he became governor, was incensed by what he read, and on June 26, 1893, he pardoned the three. "No man has the right to allow his ambition to stand in the way of the performance of a simple act of justice," he said.

The press and public reacted with a barrage of vilification. Altgeld was called a "reckless demagogue," was accused of being a Socialist, an anarchist, a "damned foreigner" (his parents had emigrated from Germany when he was three months old). He was hanged in effigy and was shown in political cartoons shaking hands with long-haired, wild-eyed anarchists who were armed with smoking revolvers, bombs and had daggers tucked in their belts. The governor refused to reply to these attacks. "Let them pitch in and give me the devil if they want to," he said. "They could not cut through my hide in three weeks with an axe." He espoused other unpopular causes, but his friends may have been right, for he was defeated in the elections of 1896 and never again held public office. He remained an influential figure, however, until his death in 1902, and was admired as one willing, at great cost, to defend the freedom of the individual.



Spies (left) and Lingg (center) were among the condemned anarchists. Illinois Governor Altgeld (right) pardoned three others.

CHICAGO'S TRAGEDY OF BOMBS AND BLOOD

THE NATIONAL
POLICE GAZETTE
The Last Act!
THE LEADING ILLUSTRATED SPORTING JOURNAL IN AMERICA.

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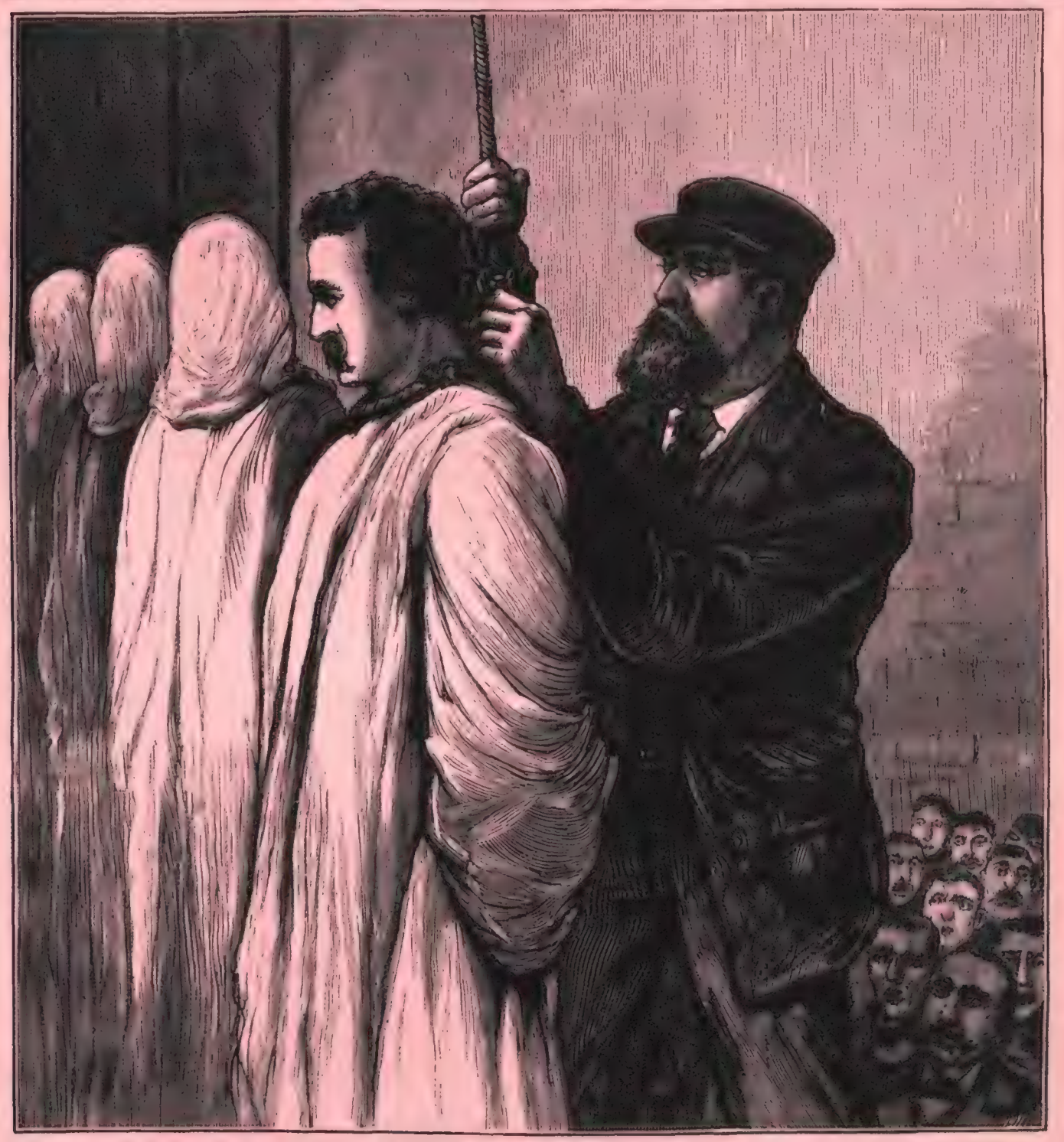

RING DOWN THE CURTAIN.

FOUR OF THE INCITERS OF THE HAYMARKET RIOT AT CHICAGO EXPIATE THEIR GREAT CRIME ON THE GALLOWS.

Hangman's hoods are adjusted over heads of August Spies, George Engel, Albert Parsons and Adolph Fischer on November 11, 1887.

By Gregory Benford

The question of life on Mars remains open

As American and Russian craft near the red planet, speculation continues that simple life-forms may have found a Martian niche

Next month *Mariner 9* will fire its braking rockets and attempt to establish a stable orbit around Mars. It will orbit the fourth planet at a thousand miles altitude and repeatedly photograph the surface with cameras that can resolve objects as small as two-thirds of a mile in width. As spring comes to the southern hemisphere of Mars, *Mariner 9* will study the atmosphere and surface of the red planet, and, perhaps, determine whether conditions might support life there.

Observed from Earth for centuries, Mars tantalized Man with signs of life—blue-green patches amid the light red plains in spring and summer. Yet *Mariner 4* in 1965 and *Mariners 6* and *7* in 1969 sent back photographs of a bleak planet with a chilly, cratered terrain and a thin, dry and unbreathable atmosphere. But these early *Mariners* flew by the planet before the Martian spring, at altitudes more than twice that of *Mariner 9's* orbit. The question of life remains open.

The existence of life on Mars probably will turn upon the nature of the Martian maria, or seas. Just as was the case with our moon, men first thought these dark patches on the Martian disk were oceans. Early observers of Mars, believing this, tried to catch reflections of the sun in the Martian maria and were sorely disappointed. But they noted through their optical telescopes that the maria appeared blue-green in spring, turned brownish and then dull gray in late summer and fall. What could this be but plant life reacting to the changes of the seasons?

The famous American astronomer Percival Lowell held this view and extended it with his theory of the Martian canals. Giovanni Schiaparelli, an Italian astronomer of the 1870s, first saw these thin lines etched on the face of Mars and called them *canali,* meaning channels in Italian. Unfortunately, the similar English word, canals, implies an artificial waterway. This led to some lively, uninformed public speculation

Seen from its tiny moon, Phobos, only 3,700 miles away, Mars looms huge, filling the sky. Next month *Mariner 9* will observe the planet from 1,000 miles away. This oil painting and others illustrating this article are by Ludek Pesek, a Czech artist, whose work has been widely acclaimed for its faithfulness to present scientific knowledge of Mars.

about Martian civilizations. In the early 1900s Lowell popularized this view of a desert planet whose oceans had gradually evaporated into space, and, for the imaginative, this left a desperate race of intelligent beings to parcel out the remaining water stored at the north and south poles. The "canals," Lowell theorized, were in fact the green belts of vegetation, 25 to

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Mars has been bombarded by meteorites into a deeply cratered landscape. The atmosphere may be too thin to hold soil up in the whirlwinds.

30 miles wide and averaging 2,000 miles long, fed by an intricate irrigation system.

The years have not been kind to this theory. Gradually, as better measurements and observations were made, it became apparent that the Martian atmosphere is thin and dry. Ultraviolet radiation bombards the surface and the nights are fiercely cold. Higher forms of life could hardly be expected to survive under such conditions.

Still, the notion of widespread plant life lingered on, though pictures taken by *Mariner 4* established some discouraging data: There were no signs of canals or any sort of water erosion, and the Martian air proved to be nearly all carbon dioxide, with little oxygen or water. What's more, this blanket of carbon dioxide is a hundred times thinner than our air. This means it cannot retain heat through the Martian night or serve as a shield from incoming radiation.

Mariners 6 and *7* confirmed these harsh conditions in 1969 shortly after man's first landing on the moon. They gave good evidence that the poles are mostly carbon dioxide ice ("dry ice"), not water. However, their 200 photographs also showed a Martian desert in which craters have been completely eroded away, perhaps indicating some form of geological activity. This and a large "slump" or settling found in the southern hemisphere indicate that Mars is by no means a totally dead planet, at least geologically. Volcanism may still be going on there. This may be an important point.

The search for life as we know it in space may prove one of the great adventures of this century, but we must be careful to watch for hidden and possibly erroneous assumptions in our thinking. That phrase—*life as we know it*—often means only *life as I am familiar with it*. Study of Mars has steadily whittled away at the chances that ordinary earthly forms of life could live there: We will find no rhododendron bushes. But various odd and obscure forms of life which do flourish on Earth might not find Mars so hostile.

Consider Earth. Here we are enveloped by air that is 20 percent oxygen, yet some bacterial colonies carry on a healthy life without it. They do not use molecular or free oxygen at all.

Instead these anaerobic bacteria draw their energy from chemical reactions that produce "food" (organic matter) by combining sulfur or nitrogen compounds with ordinary carbon dioxide. This is a perfectly legitimate way to live; bacteria in the muddy bottoms of lakes use sulfur compounds in just this manner. True, these reactions are not common because oxygen-using systems are much more efficient. Oxygen breathers use processes which yield more energy per reaction and thus through natural selection have come to be preferred in a world where oxygen is plentiful. Anaerobic life is found only where oxygen is excluded, such as in deep oil wells or stagnant bodies of water.

It seems possible that anaerobic life-forms could survive under Martian conditions of oxygen deprivation, though because of their inefficient energy-producing reactions they would grow very slowly. Still, without the competition of oxygen-users, they could well have evolved far further than they have on Earth;

they need not have always remained simple bacteria.

Of course, it may not be necessary for our hypothetical Martian plants to give up oxygen reactions altogether. Photosynthesis will still work on Mars. This chemical reaction brings together carbon dioxide, water and sunlight to make sugar, water vapor and oxygen. The signature of this process is chlorophyll's bright green. On Earth most plants live by photosynthesis, breathing the resultant oxygen into the air. On Mars, plants might instead capture this vital gas in the intercellular air spaces of their stems or leaves. The oxygen saved could then be exchanged with some other form of plant in a primitive life cycle along the lines of earthly lichens. Indeed, because the Martian atmosphere provides more carbon dioxide than does Earth's, it would speed photosynthesis, providing carbon for a carbon-based biology.

The other essential element for photosynthesis, ordinary sunlight, is a mixed blessing on Mars. There is surely enough for photosynthesis to proceed—Mars is 1.52 times as far from the sun as Earth and gets about 40 percent as much sunlight—but a lot of (for us) undesirable radiation comes along with it. At the surface of Mars, the atmospheric pressure is equivalent to that 18 miles above sea level on Earth. Such a thin atmosphere cannot stop the sun's ultraviolet and X-ray radiation, as Earth's does. Our current knowledge of the effects of such radiation on plant life is rather limited, but it suggests that Martian radiation levels may be fatal.

We should remember, though, that prolonged exposure to the sun is not necessary. Life with a low metabolic rate can live with only a few minutes of meager sunlight each day. On Mars, a plant could avoid the sun's rays for most of the day by curling up into a ball. The notion of a plant that unrolls its leaves for only a few moments each day is unusual but not absurd. In fact, the plant need not be so agile. If it grew in the partial shelter of a crater rim or near the entrance to caves or fissures, sunlight would fall on it only a small part of the day. Speculating further, one can even imagine some life-form—say, a moss or lichen—which could grow a tough turtlelike shell over most of itself for a sun shield. If it has one at all, Mars will probably have an underground ecology.

Unfortunately, radiation isn't the only problem for struggling life-forms in a thin atmosphere. Mars' blanket of carbon dioxide cannot hold heat through the night. At the equator, temperatures plunge from a comfortable 65 degrees Fahrenheit at noon, to a frigid 100 degrees below zero at night.

Could life survive such extremes? The Martian day is 37 minutes longer than our own; any native plants must be prepared for a full eight hours of (by our standards) truly intolerable cold. The lowest temperature at which earthly life is known to grow and reproduce is 11 degrees Fahrenheit below zero—speck-sized bacterial colonies found in salt water solutions in Antarctica. There is little evidence that anything thrives below this level.

Hibernation and antifreeze

But Martian life needn't *function* through the long night, it needn't carry on its metabolism in a business-as-usual fashion. It could hibernate, just as many terrestrial organisms do. Our own earthly bacteria are incredibly rugged. The normal commercial method for shipping colonies of bacteria is by freeze-drying them (see SMITHSONIAN, May 1971). Spores as well as some hearty bacteria can survive temperatures close to absolute zero and some plants survive long, chill desert nights when they trap heat inside by varying their pigmentation.

As a bit of speculation, why wouldn't a plant develop its own antifreeze? Some earthly plants produce compounds of the same general class as natural antifreezes; it may not be too much of a leap to imagine Martian plants that distribute the fluid through the stems to ward off the chill.

In addition to surviving extremes of radiation and

temperature, retention of water is a crucial point. Water is the vital factor in the formation of life. Most biologists feel that flowing water is an absolutely essential ingredient in creating the organic "soup" from which living organisms can spring, but if Mars ever had oceans or lakes they vanished long ago. Gradually any water left in the Martian atmosphere has diffused into space or frozen out at the poles.

The dry ice of the poles, discovered by the early *Mariner* flights, seem only a few yards thick, since we can see the gray crater rims jutting up through the ice. Yet, water ice may be intermingled with the dry ice in significant amounts and might possibly be a factor in explaining one of the great mysteries of Mars: the "wave of darkening."

Earthbound astronomers have seen this phenomenon repeatedly with each new Martian spring. The already brownish areas of Mars—the maria and canals —seem to turn darker and sometimes appear greener to earthbound, optical observers. In the southern hemisphere the effect is quite pronounced. As spring comes the darkening spreads out from the pole, but not in a uniform manner. Some red deserts whiten, as if frost were forming on them. This agrees with the generally accepted hypothesis that Martian deserts are high cool plateaus, where frost would readily "stick."

Simultaneously, the maria and canals darken progressively toward the equator. Early astronomers believed this wave represented the spreading of water released from the pole by the melting sun. Moist soil is darker, they reasoned, and the relatively humid winds that may blow from the pole could leave a modest deposit of moisture in the soil.

There are other explanations: Some astronomers now think weak Martian winds may blow fine grains of dust alternately back and forth across these areas, so that they appear to darken seasonally. But, if so, why do some deserts whiten at the same time? The transfer of one color of dust alone could not explain both events.

If the wave of darkening does indeed come from a dispersal of water vapor, this by no means implies a Martian summer with ponds and lakes. Bodies of pure water cannot exist at all on the Martian surface because the atmospheric pressure there is so low. Any surface water would evaporate instead. Moisture will, however, remain indefinitely if it condenses into small cracks and holes in the soil and is partly absorbed. The wave of darkening may be caused by widespread absorption of precious frost borne from the poles on light spring winds. Its arrival could revive dormant spores or plants which could, in turn, suck dry the soil around them and store the water in their tissues.

Life would be hard for them. They would be forced to mine the Martian soil for their food, including nitrogen and sulfur if they do not use oxygen. Dim sunlight would kindle the complicated photosynthesis chain in them, but they could not remain exposed too long for fear of radiation damage from ultraviolet and X rays. Add to this the necessity for regular hibernations and such an existence seems bleak indeed.

Of course, this picture is very Earth-centered. Harsh conditions to us may not be so difficult for an adaptable microbe. On Earth, bacteria reproduce about every half hour, allowing them to mutate quickly and adapt to new circumstances. If only a tiny fraction of a bacterial colony can survive and reproduce for a day, chances are good that they will be around for the indefinite future. They are true cosmopolitans, able to spread and thrive where other, more sophisticated life-forms perish.

Life in frozen oceans?

Should micro-organisms exist on Mars, it becomes conceivable that higher forms have evolved from them. The pioneer bacteria, if they ever existed on Mars, could pave the way for later forms by changing the soil and atmosphere of the planet. Humus would slowly collect, making the soil more fertile. Small bacterial colonies could begin to breathe needed gases (such as nitrogen) into the Martian air or store it in the soil. This is the path we envision the earliest steps life took on our own planet, and they are not totally impossible for Mars.

But we have overlooked one point. Life on Earth almost certainly began in the seas. Mars plainly has no seas. Did it ever?

If it did, the oceans certainly did not last very long. The *Mariner* probes showed little erosion that could be attributed to water. Still, it is not impossible to imagine that shallow seas did once form in the very

The waxing and waning polar caps probably are made of frozen carbon dioxide and may have traces of ice, key to speculation on Martian life.

early days of the planet. They might not have had time to cause significant erosion—on a planet with only one-third of Earth's gravity, the effect of falling water would be less important.

Any such early seas would have evaporated quickly. The central question is whether they would have frozen before the evaporation was complete. If so, great sheets of ice once stretched across the face of Mars. Over the millennia, dust would have blown over them and finally buried the ice beneath the surface we now see.

This "frozen-ocean theory" is pure speculation, but it does not contradict anything we now know and it leads on to some interesting speculation. The buried ice sheets could become a source of water for life-forms near the surface, if some process gradually melted parts of the sheet and moved the water upward. Two things could do this—hot volcanic magma from below or occasional meteorites from above.

Mars probably has some low level of volcanic activity, as well as Marsquakes. The "slump" found by *Mariners 6* and *7* in the southern hemisphere supports this assumption. Periodic disturbances of this sort would carry water to the surface where it can disperse, perhaps even forming clouds. (For decades observers have reported white clouds over the maria which lasted several days.) A slow seepage of water to the dessicated plains above would gradually raise the soil humidity around the region and could even nurse primitive vegetation with warmth and water. Such areas, darker than the deserts, may be what Earthbound astronomers identify as the maria.

In the slow geological processes of Mars, fissures, fault lines and cracks would form. Chains of volcanoes might arise as they have on Earth. The process would be aided by meteor impacts which open great fractures and cracks in the crust. The heat generated by such collisions would melt subsurface ice and allow the steam and water to escape through the cracks.

A full-fledged asteroid which fell on Mars would have enormous effect. Near the point of impact, heat would be retained beneath the surface for a very long period, percolating water upward. The soil would darken from the released humidity. The long fissures

and fault lines spreading radially outward from the impact crater would also show darkening of the nearby soil. These may be what we see as the famous Martian canals.

If the canals are simply coloration near an ancient fault line, perhaps this is why the *Mariners,* with limited color resolution, failed to find them. (It has been suggested, instead, that the canals are merely optical illusions, a case of the eye "filling in" lines between dark spots.)

The chain of supposition here is quite tenuous and may quite easily prove wrong at some vital point. Still, it does provide a consistent interpretation of the changes men have closely watched on the Martian surface for over a century.

Yet, even if Mars retains some subsurface water, the planet may still be barren and lifeless. The dark maria and canals may only represent the image of the underground ice beds, projected on the surface by soil humidity. Life might still find such an environment too bitter. After all, even if life arose in the hypothetical ancient seas of Mars it may not have made the difficult transition to a dry, cold ecology.

It is just barely possible, though, that oceans themselves are not necessary for the formation of life. Recently Drs. Norman Horowitz, Jerald Hubbard and James Hardy at the California Institute of Technology's Jet Propulsion Laboratory subjected a mixture of gases to ultraviolet radiation in conditions like those we believe exist at the Martian surface. They found that they had produced formaldehyde and acetaldehyde, two important materials for the synthesis of organic compounds. A similar process is thought to have occurred on Earth at the beginning of evolution.

Raising the chances to "unlikely"

However, these organic products must in turn be protected against ultimate destruction by the same ultraviolet radiation which formed them. This means newborn molecules must be buried by dust or blown into tiny crevices to avoid the deadly sting of the sun. If this does not happen in just the right way life-producing processes cannot go on.

Whether this danger and all the other barriers against life on Mars—cold, dryness, thin atmosphere—have been surmounted by evolutionary processes is impossible to estimate. Although the possibility that organic matter can arise on the surface without an ocean is a definite plus, according to Dr. Horowitz, it only increases the possibility of life on Mars from "very unlikely to unlikely."

The *Mariner* orbiter that will arrive over Mars November 13 will not decide the ultimate question. Neither, probably, will the Russian probes, *Mars 2* and *3,* which may reach the red planet shortly before. (Typically, the Russians are being secretive about their project. The Soviet Embassy in Washington refers questions about it to NASA, whose scientists believe the Russian craft includes a landing vehicle.)

Mariner 9, in orbit for 90 days, will expand our knowledge of Martian conditions by quantum jumps. *Mariners 4, 6,* and 7 were fly-by craft, unable to snatch more than a few hours' glimpse of the planet. On *Mariner 9* two television cameras equipped with color filters will provide unexcelled visual coverage for

more than three months, scanning about 70 percent of the Martian surface, recording diurnal and seasonal changes. An infrared radiometer will analyze surface temperatures of the soil and the polar caps, while an infrared spectrometer investigates atmospheric composition and temperatures and refines data about the presence of water. The ultraviolet spectrometer aboard *Mariner 9* will probe cloud formations, atmospheric composition and pressure, radiation levels, the wave of darkening and also ozone concentrations.

One primary specific result will be the pinpointing of optimum landing sites for the Viking lander, which is scheduled to touch down in 1976. Optimum, in exobiological terms, means places that are relatively low, warm, moist and atmospherically dense.

However, life-forms on Mars may be so small and unusual by our standards that even the experiments aboard Viking—which include a sophisticated soil-analyzing instrument—will not decide the issue with real certainty. Perhaps only a biologist on the spot can decide if there is life on Mars, and so it may remain an open question well into the 1980s.

Lichenlike shrubs could live on the Martian plains. Reports show life-forms must be smaller than these but do not preclude their existence.

By Charles B. Seib

From the city to the woods was a giant step

On 33 acres, happily gone to seed, a harried newspaper editor has built his cabin and now jots down his peaceful thoughts

My son and daughter call it Walden South because I have a cabin I built myself (somewhat larger than Thoreau's) and a pond (much smaller than Thoreau's), because I like to be alone here, and because Thoreau was the most powerful of the influences that brought me here. To me Walden South sounds presumptuous. To me this place is The Woods.

It consists of 33 acres of gently hilly Virginia countryside about ten miles from the Shenandoah National Park and the Skyline Drive. I found it after six months of searching for something wild, secluded and within my means. It is all wooded except for a weedy meadow. The pond, an irregular half-acre in a treed valley, exists courtesy of the Agriculture Department's Soil Conservation Service, which laid it out at taxpayers' expense, and a man with a bulldozer, who dug it at mine.

The cabin, up a short hill from the pond, is a single 16-by-20-foot room. On the outside it is rough-sawn vertical boards and battens, stained gray-brown. On the inside, the timbers are exposed, with diagonal pine sheathing between. The roof is peaked and covered with rough cedar shakes, and inside the cabin the big rafters reach upward in a most satisfying way. There is no plumbing, no electricity, no telephone.

Author's cabin blends into the woods above pond. Working weekends, he took 39 months to build it.

From the book, *The Woods*, by Charles B. Seib, Copyright © 1971 by Charles B. Seib; to be published by Doubleday & Co., Inc.

Water is carried by bucket from a small spring housed in a redwood box about 100 feet away.

What prompts a city man with a demanding and stimulating job, a fine family and a comfortable home to search out a private place, to assume the burden of paying for it, and then to undertake the task of building his retreat? What is there that makes him almost weekly, over a period of years, get up before dawn on his day off, drive 85 miles, work like a man possessed, and then drive back, declaring himself renewed, rested, ready to face again the pressures, frustrations and terrors of the world he lives in?

It is a compound of many things. Closest to the surface, probably, is a dissatisfaction with the way the world is working out—with what man is doing to it—and a desire, childish perhaps, to turn one's back on it for just a little while. After a week of dealing with the grist of today's newspapers—the violent, the inhuman, the inhumane, the stupid, the cheap, the mass-suicidal—I must reassure myself that some things still are: unpoisoned trees and grass, untainted water and air, the old satisfactions and verities of working with one's hands and creating something real, however inconsequential.

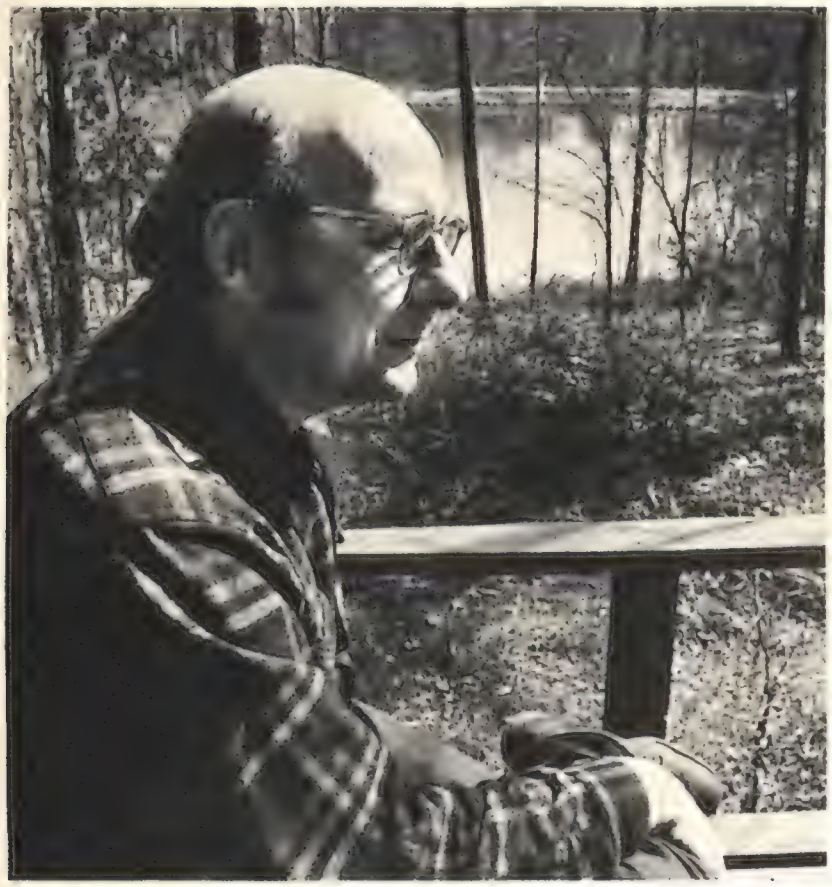
I think Henry Beston said it well in *The Outermost House:* "The world today is sick to its thin blood for lack of elemental things, for fire before the hands, for water welling from the earth, for air, for the dear earth itself underfoot." He wrote that in 1928; how much truer it is today.

My undisciplined meadow

One enters The Woods by a quarter-mile access road which branches off a disreputable state road and traverses another man's land. The access road meets a wooden bridge. Cross the bridge and you are in the meadow and on my land.

The quail love the meadow, but it would turn the farm agent's stomach. Except for an occasional foray with a machete against the handsome bull thistles which, I am told, threaten total devastation once they take hold, I allow life in the meadow to go its own way. Undisciplined pines and cedars are working down the hillside. Sumac and other shrubby invaders grow even bolder. The grass has just about given up to daisies, Queen Anne's lace and a miscellaneous company that includes a half acre of ambrosia-scented wild strawberries. I am overseeing the transformation of cleared land to woodland. It takes absolutely no work. I plan to spend the next couple of decades at it.

In the middle of the meadow, halfway up the hill, stands a vine-wrapped stone chimney, all that remains of an old farmhouse. My neighbor, although he is in his eighties, can't remember anyone living there. He



Author Seib contemplates The Woods. He is managing editor of the Washington *Evening Star.*

says that when he was younger the deserted house was beginning to fall down, so he pulled down the rest of it in order to get the beams for a broader house he was building. "Somebody was supposed to come and take the chimney stones, too," he told me, "—those stones are worth a lot of money—but the man never came, so I left it there." I'll leave it there too.

All of The Woods was once farmland. The reminders are there in the remnants of chestnut fences, in the rock piles the farmer made as he cleared this stony land for plowing and in the gullies, now softened by the years and overgrown, that he caused by his primitive, land-depleting farming practices. Fortunately, these same casual practices—or perhaps a recognition of the part insect-eating birds played in his ecology—caused him to leave some trees standing, so that sprinkled through the lanky cover that has sprung up since the worked-out fields were abandoned, probably 50 years ago, there are gnarled senior citizens with short trunks and spreading branches which must once have provided dapples of shade in the fields of corn.

Candor forces me to admit that this is not a sensational piece of country property. There are no breathtaking views; there is one spot where you can look across to Old Rag Mountain in Shenandoah Park, but it takes some doing. The trees are not forest giants; most of them are less than 50 years old. The babbling brook I wanted when I started my search for land is represented only by a finger-thin waterfall below the spring. In late winter and early spring its flow becomes as thick as your arm, but in dry spells it sometimes closes down completely.

But this is a quiet place. Back in the cabin, one is about as alone as a man can be these days. Only the distant bawling of a steer or the snarl of a chain saw or, rarely, the swift, frightening roar of a military plane (I'm mercifully away from commercial air routes) breaks the stillness.

I don't know what the ideal size of a place in the country might be. I am pleased that there are still, after four years, places in these 33 acres I haven't visited and that it is possible to become lost—briefly, to be sure—among the pines. I still can move about with a feeling of anticipation and discovery. I think a country place should be big enough to permit that. Probably, though, one acre or five acres can provide as much enjoyment as 33 acres or 300. Indeed the discoveries that can be made in a few square yards of natural terrain are uncountable.

Down with the developers

Having built a cabin and installed the pond and, in the process, having become closely acquainted with this little patch of woods, I feel something deeper than the joys of acquisition I felt back in the fall of 1965. I am experiencing the attachment a man can feel for the land. And I am possessed by a quixotic desire to protect this particular bit, to keep off the developers and the bulldozers that surely will come someday. It may seem silly to worry about bulldozers. You can still buy land here for less than $500 an acre. But when I reflect that this spot, bucolic as it now is, will be less than 30 miles from the megalopolis the experts say will extend, some not distant day, from Boston to Richmond, then I think there is reason to prepare for the invasion.

At the same time, I have found, to my dismay, that I have a touch of the developer's sickness. The temptation was sometimes strong to lay about with ax and machete, to clear the land and make it "pretty." But now I want none of it. Nature will have to take care of the unfit and the misshapen and the aged in her own way.

The Virginia pines have nothing to fear from me. They can continue in their ragged, fragrant way. I'm suspicious of woodlands that have been trimmed and cleared and cleaned up to achieve a "park effect." I don't think the rabbits and deer and snakes and birds would like it. I think they probably are happy that I have left in great piles the tangle of roots and trunks and branches collected by the bulldozer when the pond was built. It had become overgrown with honeysuckle and briers and provides a safe haven for all

Ruined chimney haunts the meadow. This is one of the book's 16 sketches by William S. Garner.

kinds of creatures. Are they happy, though, with the pond itself? Was I right, I wonder, to decree that this body of water was to be inserted in this little valley where nature, in her wisdom, had provided only a tiny trickle? More troublesome still, am I right to apply copper sulfate to the pond when the algae coat its surface and interfere with the swimming? Am I different from the developers and the DDTers?

On Tuesday, May 17, 1966, I noted in my journal, "I poured the first concrete for the cabin. It took two 90-pound bags of mix to make the base for one pier." And on Tuesday, August 12, 1969, I recorded that I had applied the last bit of stain to the outside of the cabin. "It came out even, right to the last brushstroke. Now the cabin can be called finished."

In the 39 months between I had a wonderful time. I don't know that I'd try it again. But I'd give up a lot before I'd surrender the memories of that long adventure in The Woods.

Visitors to The Woods sometimes get annoyed when I insist that anyone with the will to do it can build a cabin. Viewing the finished product, they assume that it could only have been done with special knowledge or skill. But that isn't true. I say anyone—man, woman or sturdy teen-ager—can build a cabin in the woods.

The secret is, never ask yourself the question, can I build a cabin? Instead ask a series of lesser questions, all of which can be answered yes:

Can I lay out a rectangle, using high school geometry ($a^2 + b^2 = c^2$) to make sure its corners are square and a simple line level to make sure it is on an even keel? Yes.

Can I dig nine—or eight or 12—shallow holes for the foundation piers? Of course.

Can I mix concrete and pour it into the holes and then build the piers themselves of stone and mortar? Yes, and you'll probably get a great deal of pleasure out of the latter part.

Can I saw timbers to make the sills and joists and put them in place on the piers? Yes, but you are going to sweat over it.

And so on until that day when the question will be, can I put the last of the shingles along the crest of the roof, and the answer will be a triumphant yes.

Start with your privy

So how do you get started? Every trade has its apprenticeship, and the trade of building a woodland cabin is no exception. Before you start your cabin, build a privy.

There are several reasons, aside from the obvious one, that a privy is a convenience worth having early. Certainly there is no better way to get acquainted with your land than to dig a four-by-four-by-four-foot hole in it. By the time that is finished—and a long time before it is finished if, like me, you encounter rocky soil—you will have thoroughly baptized your land with your sweat. After that, no one can take it away.

A more practical reason for starting with a privy is that it is a cabin in miniature. You will learn the importance of getting your foundation square and your vertical members plumb, with no severe penalties if you don't quite succeed. You will learn the tricks of working with heavy green lumber of imprecise dimension. You'll learn to pace yourself and to heed, within reason, Thoreau's admonition: "Yet after all, the truly efficient laborer will not crowd his day with work, but will saunter to his task, surrounded by a wide halo of ease and leisure, and then do what he loves best."

Once the cabin piers were in and set, I was ready to place the sills. These are the heavy oak timbers on which the framing rests. This working with green oak was educational in several ways. It would have been impossible for me to carry in these timbers from the spot the sawmill truck unloaded them, so I hired a neighbor with a horse to haul them in. It is an indication of the economy down in the neighborhood of The Woods that when I asked him how much he

charged for such work, he replied, somewhat apologetically, "that will be $1.50 an hour—with the horse."

I also learned that tennis players are not the only people who get tennis elbow. I developed a miserable pain in my right elbow that made every hammer blow a little bit of agony. A colleague who plays tennis assured me that I had contracted tennis elbow and that the answer was a trip to the doctor for cortisone shots. Instead I prescribed my own therapy—continued use—and after three uncomfortable months the affliction quietly disappeared, never to return. I don't think it was too great a price to pay for the special treat that comes with working with green oak—the winy, almost intoxicating fragrance of the fresh-cut wood.

By the time the subfloor was laid, midsummer had come and I was literally shedding pounds of weight with every work session; one weekend I got rid of eight pounds (which have since returned, of course). It wasn't all work, though. Most work days ended with a bath in the pond and a lazy hour of floating on an air mattress in the sun, contemplating the treetops and marveling at my good fortune. By the first chill of fall the skeleton of the walls was visible. The size and shape of the cabin now were coming clear.

I have heard it said that two men on a job can work three times as fast as one man alone. That is probably true. I know there were times when another pair of hands and another strong back were sorely needed. But maybe there is a corollary truism: The satisfaction to be gained from doing a job on your own is three times what you experience if you have help.

I didn't get around to shingling the roof until the summer and fall of 1968. In the meantime, the roofing paper provided satisfactory protection. Applying the shakes was a long job—I started in July and finished in November—because of the pitch of the roof and the irregularity of the shakes.

My final job was also a slow one—laying the floor of three-inch tongue-and-groove pine boards. I finished the floor with two coats of a thin varnish-type sealer. The result looks like raw wood, but it is easier to keep clean than raw wood would be.

So that is the cabin—sturdy and neat, but not fancy. And here in the evenings I sometimes try to tell how I come to be here and what it means to me.

May: It was a gloomy trip down, and I was beset by gloomy thoughts. The raw air and an intermittent drizzle—a mizzle, Thoreau would have called it—provided a chill and soggy beginning for my spring visit.

I hoped for the catharsis that a trip to The Woods usually brings, but this time I was convinced that even if the weather were to turn glorious it could not obliterate a black discouragement that has been oppressing me. The killing continues, the college kids grow increasingly bitter, the cities fester. There is fury and frustration on Capitol Hill. For the first time in many months I have brought a radio down here with me. There is the possibility that all hell will break loose, and I will have to hurry back to the paper. I must turn it on tonight before I go to bed to hear what has happened since I left the city.

Perhaps against even these odds—black times, black thoughts, a gloomy day—The Woods can work its magic. There can be no deception, of course, and no escape. The killing *does* go on, the kids *are* angry and bewildered, and we *are* unquestionably making a mess of our world. Yet, sitting at my oak table and watching the rain stipple the pond, I can feel my rage cool a bit.

Human folly has not stopped spring. The violets are out along the banks of the little stream that runs from the spring box to the pond. The pond itself is dusted with yellow pine pollen. The pines are putting out new shoots, as erect as Christmas candles. The strawberry plants in the meadow are in bloom; maybe this year I will beat the birds to the fruit.

I have just checked the radio news. Depressing but not cataclysmic. It's time for bed.

Nature: The five-lined skink is my companion when carpentry is afoot. Let a stack of lumber be assembled on the porch, and before long he will be there, bustling about and displaying his agitation every time a board is removed. He's a pretty and lively little lizard about six inches long, and as he goes about his duties as superintendent of the lumber pile his bright blue tail sparkles in the sun. I am tempted to try to catch him for a more intimate visit, but the nature book

Cabin lacks electricity, plumbing and clutter. Franklin stove heats it. Hand-built bunks (left) become a settee when upper swings down.

says that his tail is very brittle and might break off.

Some of my neighbors make their home in and around the spring box. For a time a red salamander lived in the box, but one day I found his corpse inside the crock—I must have failed to seat the lid tightly and he apparently got curious. More recently, a pair of little frogs has been in residence there. I tried to scoop them out a few times, but they were too quick for me. So again it's a case of live and let live, and who can say who is landlord and who is tenant?

September: It is the evening of Labor Day. I worked at the paper, but the holiday schedule meant an early last edition so I was on the road, bound for The Woods, by 2 o'clock.

Dusk has brought with it a slight chilliness, and a few minutes ago I lit a small fire in the Franklin stove. It isn't absolutely necessary, but it is companionable. This will be a good night for sleeping. As the fire crackles softly and the cicadas sing of the dying summer in the trees outside, I speculate about what my feelings would be if this cabin I worked so hard on were destroyed, if this land I value so highly were taken from me. Suppose vandals were to come and burn the cabin or reduce it to a pile of broken boards and timbers? Or suppose the power company were to come through here with its steel towers, as has been rumored, taking my land by condemnation and poisoning its path of progress through The Woods?

I'd be sad and angry, I am sure, but I like to think that I'd not be completely desolate. Early in my time here, when the cabin was only a platform on piers, I was twice visited by intruders. Each time they broke a lock on the privy and ransacked through the tools and supplies I stored there. They stole only a little food, but I was disturbed by this invasion of my private place.

When the cabin was completed I posted a sign on the door: "NOTICE—Nothing to Eat or Drink and No Valuables Inside. Please do not Break in. C.B. Seib, Owner." It seems to have worked.

I have come to realize that I have a hold on this place that no one can wrest from me. I have said that I doubt that I'll ever build another cabin. I'll always have this one—not only the cabin but the building of it. And if it comes about that I must give up physical possession, that will be acceptable, if painful. I hold a deed that is more binding than the one in the courthouse, one I will never have to surrender.

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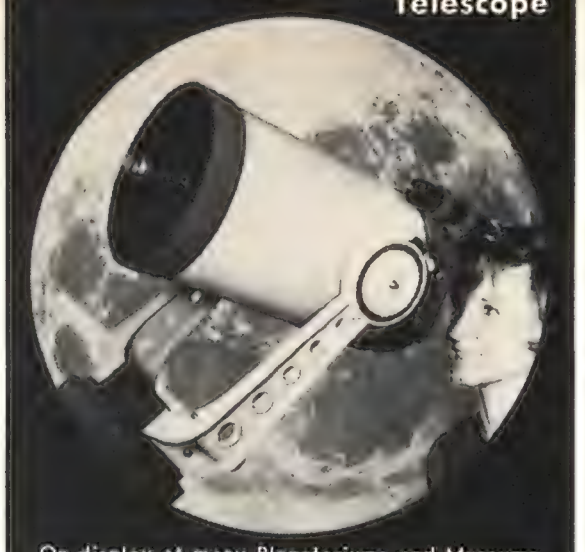

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Book reviews

The Continent in Our Hands
Charlton Ogburn
(William Morrow, $7.95)

In a prologue, Charlton Ogburn says he drove 9,600 miles around this country in 22 days for three reasons. First, because he had a deadline. Second, "There was the adventure of it." And third, to achieve "total immersion in the country as a whole." His purpose, he says, was to write a book about the natural features, primarily the geology, of the country.

This is that book, and while he uses the geology as its framework he goes off in various directions, into history and fragmented biography, into sociology and economics, into personal likes and dislikes and whims and speculations, even into religion and the fringes of philosophy. Sometimes these excursions, which make up about half the book, are good reading, sometimes they are as dull as the author finds the deserts, and sometimes they are amusing glimpses of a mercuric man in fulmination.

Perhaps a geologist could pick holes in Ogburn's geology, but I wouldn't even try. Like most converts—he says he came late to that science—he seems to have done his homework and is full of the specialized language as well as the convert's zeal. I do raise one geographical question: Why does he presume to judge and discuss this country as a whole when his zip-trip took him only around the rim, so to speak—he didn't even touch the great midlands of Ohio, Indiana, Illinois, Wisconsin, Iowa, Missouri, Nebraska, Kansas?

He speaks of other, later trips, but this only breaks the continuity of the trip basic to this book. When he bemoans the

absence of farmers, for example, he is racing past the wheat fields of South Dakota. One wonders if he expected the wheat farmers to be standing in their fields, in early May, waving to tourists.

His heart is big and in the right place. He hates the cheap, the garish, the ugly and the wealthy-ostentatious. But he is oddly given to urban quirks. He thinks all small towns are ugly and deprived. He thinks that when he has really tried, man has improved on nature. And yet he says, "That so much remains of the land we have taken over has surprised me." I am surprised that he fails to point out that even our biggest cities are lost in the landscape, once one gets out of the range of their suburbs. Particularly when one gets away from the seaboard, east or west. Inland America remains huge and strikingly unbuilt-upon. The problem, and I wish he had stated it more clearly, is to keep the cancerous blight from engulfing those inland areas.

Ogburn responds almost with whoops of triumph to the great natural spectacles —the geographic and geologic—features that have been celebrated before. The Grand Canyon awes him, the western deserts are rather baffling, both beautiful and dreadful, the various mountain chains get spates of geological description —he snorts at the Petrified Forest, marvels at the Dakota Badlands. He is aghast at what the loggers have done to the redwoods. In the end he says, "Our continent is steadily deteriorating."

In what he calls an epilogue he tells of still another trip, this from his home in the Washington, D.C. suburbs to the Virginia coast, and capsulates colonial history. And he concludes with pleas and warnings, touched with mysticism. "Old Earth!" he exclaims. "Earth and Mystery! I feel close to both watching the waves roll in on the Virginia shore as they roll inexhaustibly on all the shores of the planet, and will roll, let man do what he may."

In summary, Charlton Ogburn has written an insistently personal book on America, excited, loving, angry, naive, disillusioned and at times careless and hasty. You could make the same trip in less time by air, but you wouldn't have the company of a geology buff at whom you can smile even when he is mistaking statistics for facts and being outrageously opinionated. Better choose the book.

—Hal Borland
Naturalist and author

The First American
C. W. Ceram
(Harcourt Brace Jovanovich, $9.95)

Ceram's absorbing and scholarly account of the development of North American archaeology is a welcome addition to the popular literature of anthropology, especially in the light of several recent volumes of dubious scientific merit on the subject. At the same time, for the informed reader, *The First American* will be a disappointment.

Author of the classic, *Gods, Graves and Scholars,* Ceram begins by giving some long overdue credit to the pioneers of American prehistory. He recounts the fascinating adventures of Leif Ericson, Cabeza de Vaca and other early explorers, and describes the tentative scientific probings of President Thomas Jefferson, the first American archaeologist. Then Ceram falls into the same trap that ensnared the early archaeologists themselves, and devotes a large share of the book to the spectacular ruins of the American Southwest. This preoccupation with the exotic has often resulted in a distorted view of early American cultures which is only now being rectified by many scholars.

Nevertheless, the story of southwestern archaeology is an exciting one, and Ceram brings it vividly to life. It is in the brief chapters on archaeological theory that the book's most serious weakness is to be found. The American view of archaeology as a science of human behavior —as *anthropology*—is regarded by Ceram as a "peculiarity." In his patronizing and occasionally embarrassing efforts to certify native American cultures as authentically human he betrays an Old World historian's bias. The former abhorrence of theory in American archaeology is rightfully criticized, but incredibly naive statements like "with pottery humanity's *culture* begins" reveal a profound misunderstanding of what archaeological theory *is*. Quite apart from the dubious value judgment here, the author overlooks recent studies which go beyond the descriptive-chronological uses of pottery and demonstrate that ceramic variability reflects a behavioral structure.

Despite these objections, there is a lot to like in Ceram's book. His objectivity and scholarship are impressive and, just as importantly, he treats the subject in an

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engaging manner, unlike so much of the "scientific" literature of archaeology.
—Robert L. Humphrey, chairman,
Department of Anthropology,
George Washington University

The First Sex
Elizabeth Gould Davis
(G. P. Putnam, $7.95)

"These miserable creatures," J. Richards could say of 17th-century women, "who have no other knowledge than that they were made for the use of man." Elizabeth Gould Davis takes this as her text in *The First Sex* to prove that men have perennially belittled, handicapped, hobbled and even tortured women to teach the lesson that women were put on earth to serve them.

This "natural order of things" has not always been the case, Miss Davis asserts. Her thesis is that before the great civilizations of Sumer and Egypt, there was a previous civilization, ruled by women, that worshipped a great goddess. The idea is not a new one, but it is supported by exhaustive quotes from Robert Graves, Theodor Reik, Karen Horney, Margaret Mead and Euripides, among others. From this, Miss Davis moves to her major theme: that far from being an adjunct to men, or the second sex of Simone de Beauvoir's title, woman is the first.

Women are the great civilizers, she asserts. Furthermore, the oldest words in the language of the Indo-European people, dating back to the matriarchal (gynarchic) period, are for "women's work": for spinning and sewing, for grinding and milling grain, for taming animals, for the use of fire in cooking, for the art of counting in numbers, for the building of walls and the wearing of clothes. In this lost civilization, when men and women worshipped a goddess, abstract concepts of justice, peace, intelligence, wisdom, rectitude, devotion, liberty, mercy, soul and freedom were established. All have feminine genders. Miss Davis cites evidence to support her belief that the Christian Church was the great enslaver, rather than emancipator, of woman.

Reading through this thoroughly documented work, with its fund of miscellaneous information (including just exactly how a chastity belt worked), is enough to give any woman a swimming, as well as a swelled, head. Unfortunately, many of Miss Davis' arguments are so patently absurd (she states that all men hate women) and the tone of her writing, which should be dispassionate, is so indignant and querulous, that it will cause her book to be dismissed by the very people who should be assessing it seriously.
—Meryle Secrest
Cultural reporter, *Washington Post*

Watermelon Summer
Jeffrey Golden
(Lippincott, $4.95)

Unwittingly perhaps, a member of the Dropout Generation breached the communications barrier between his "peer group" and the outside world with a revealing exegesis. It is the diary of one undergraduate's pivotal summer foray into the Deep South, an adventure seemingly prompted by equal parts of social conscience, radical commitment and ennui—the latter resulting from Harvard's being closed early by riots in the spring of 1970.

Seeking an outlet for his energies, this white student joins a brigade of Cambridge volunteers to work on a black-owned cooperative farm that is struggling for survival. Implicitly, the worthwhile effort is of modest scope and self-centered motive. He acknowledges that "a summer in Georgia promises to affect me substantially more than it will Georgia."

There are glimpses of the South and of southerners, black and white, although the focus is always on the writer. Of his host, he writes: "He's a low-pressure man with a stoicism that couldn't be more different from my temperament. He talked, just a little, about spending his whole life here, about how some years are good and some not so good. All I could think about was 60 years of periodic drought, flood, a depression, with no one but himself—and the good Lord, it seems—to turn to. And yet he is as quietly casual as if he had breezed through a life of plenty." Part of the lesson is lost.

For four whole weeks Golden works for New Communities Inc., living with rural blacks, listening to their honky-hating leaders, surviving run-ins with cracker cops, weeding peanuts and picking watermelons. Then they truck north to sell at Fillmore East, the now closed rock mecca of Greenwich Village, sending the proceeds back to the farm.

Golden learns something. "A long time in a big field" doesn't leave much energy for socio-political theorizing. This is something of a shock, for he is of a group that seems addicted to theory, rhetoric and group consciousness. The upshot of the total experience is simple. The author decides that if he is to find "further growth," it will not be back at school.

Instead, he becomes a union apprentice to learn carpentry, which has "both a potently artistic and life-support function." Yes, he is justifiably seeking the basics. But no, after "21 years of official childhood," the boy can't learn to saw a board or hammer a nail without mouthing it to death.

What emerges is the troubled portrait of an earnest youth agonizing over wood when he hasn't learned what trees are. The prose is awkward, callow and flecked with vulgar vernacular; but the malaise may be pandemic today, and here is one case history. I doubt that *Watermelon Summer* is what Jeffrey Golden meant it to be; the rind and pits are meatier than the thin-juiced fruit.
—Phillip Kopper
Film writer, now working on a novel

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"All Bach Concert" on October 2 and "Italian Baroque Concert" on October 4, sponsored by the Division of Musical Instruments and the Associates, begin at 8:30 P.M. in the Natural History Museum Auditorium. For ticket information call 381-5157. A free workshop in baroque music will be held on October 3 at 3 P.M. in the Hall of Musical Instruments.

Division of Performing Arts
"The Proposition," improvisational theater will turn audience suggestions on the political or social scene into short encounters or musical comedy on October 8 and 9 at 8:30 P.M. "Proposition Circus," a children's version, will be held October 9 at 1:30 and 3:30 P.M. For ticket information call 202-381-5395.

"Tom Sawyer" is being presented by the Allan Stevens company with 15 new puppets and a newly adapted script at the Smithsonian puppet theater daily, Wednesday through Sunday. For ticket information call 202-381-5395.

National Collection of Fine Arts
"Lee Gatch (1902-1968)" is a select collection of some 30 works showing Gatch's move from stylized abstraction to collages of stone, canvas and paint. A lecture titled, "Lee Gatch and his contemporaries: abstract expressionism in the 40s," will be given on October 30 at 3 P.M. by Ben Summerford of American University.

"NCFA Printmaking Day" held from 11 A.M. until 3 P.M. on October 16 will feature public demonstrations of silk screen, woodcut, etching and lithography by John C. Sirica, NCFA artist in residence, and other local printmakers. Tours will be conducted of the print collection, study room and workshop where visitors can make their own prints.

"Boris Anisfeldt" exhibit includes watercolors and drawings by this artist, best known for his ballet and opera designs.

Smithsonian Museum Shops
Christmas shops featuring gifts and ornaments from all over the world will open on October 18 in the Museum of History and Technology and the Arts and Industries Building.

Freer Gallery of Art
"Eugene and Agnes E. Meyer Memorial Exhibition" includes Chinese and Japanese bronzes, jades, sculpture, paintings and ceramics. Many of the 37 objects have not previously been exhibited.

Anacostia Neighborhood Museum
"Man's Greatest Adventure" is an exhibit illustrating the contributions of the black man to science in America.

Museum of Natural History
"Spiders" is an exhibit, prepared by Ann Moreton, of photographs, specimens, some live spiders and web transfers. (See SMITHSONIAN, August 1971.)

"Korean Village" compares the traditional with the modern way of life in a Korean village, including artifacts and photographs from a recent expedition by the Smithsonian's Dr. Eugene Knez, associate curator of anthropology.

Smithsonian Commons
Luncheon facilities for staff, resident scholars and all members of the Smithsonian Associates are located in the original Smithsonian Building. Open weekdays from 11:30 A.M. to 2:00 P.M., the Commons offers a buffet luncheon from $1.25 to $1.75 upon presentation of a membership card.

Smithsonian Building
Two exhibits commemorate the Smithsonian's 125th anniversary: a retrospective view of early exhibits and original documents in the South Tower and a preview of things to come in the Great Hall.

Traveling Exhibition Service
Over 70 Smithsonian-sponsored exhibitions open each month throughout the United States and Canada. For a complete listing write: Traveling Exhibition Service, Smithsonian Institution, Washington, D.C. 20560.

Canton, Missouri—"Contemporary African Printmakers" (Culber-Stockton College, October 16-November 14).

Colorado Springs, Colorado—"Contemporary Finnish Design by Tapio Wirkkala" (Colorado Springs Fine Arts Center, October 9-November 7).

Cheyney, Pennsylvania—"The Romans in Ancient Romania" (Cheyney State College, through October 24).

Orange, Texas—"Portraits by Belgian Children" (Orange Junior Museum, through October 24).

Salt Lake City, Utah—"Volcanoes and Volcanism" (Utah Museum of Natural History, October 9-November 7).

Charlottetown, Prince Edward Island, Canada—"Photography and the City" (Confederation Art Gallery and Museum, October 9-November 7).

National Portrait Gallery
"Portraits of the American Stage: 1771-1971" presents 100 portraits of and costumes worn by personalities of the performing arts in the United States. (See SMITHSONIAN, September 1971.)

"Portraits by Winold Reiss," used to illustrate *The New Negro* by Alain Locke, depict the central figures who contributed to the Harlem Renaissance.

Arts and Industries Building
"Apollo Photography" exhibit features samples of lunar-surface and command-module movie, still and television cameras like those used in the Apollo program with photographs taken by them.

Stereoscopic closeup photographs taken on the lunar surface are on display with a camera identical to the one used to take the pictures.

The Apollo exhibit includes a flight-weight, operational, back-up Lunar Module (See p. 50).

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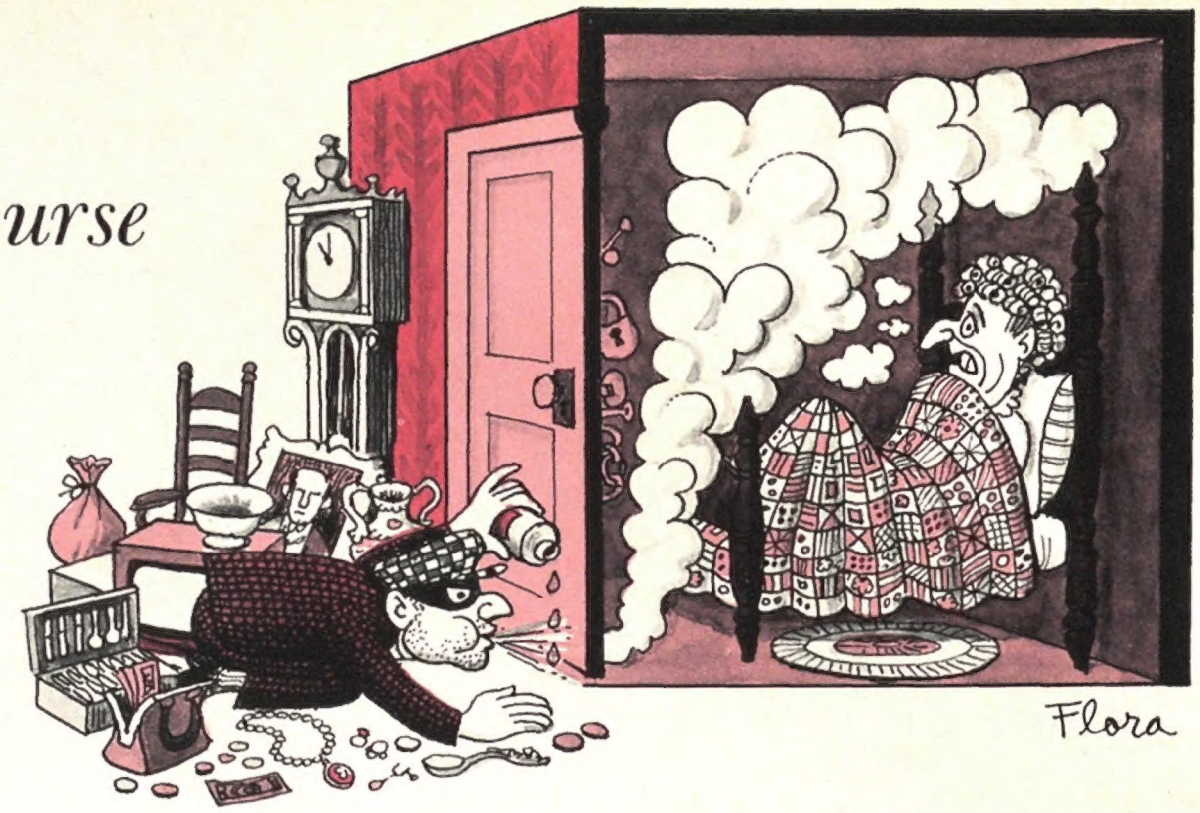
CHILDREN, INCORPORATED

By Patrick Ryan

'Who steals my purse steals trash'—so why guard it?



Ill-informed though we are about the latest score in the battle between good and evil, earthly news suggests that there is no change in the war between the haves and the have-nots. The oscillating struggle persists as those with a surfeit of worldly goods strive to defend their property from those less well-endowed who essay to engineer greater equality by simple larceny. Burglaries rank first among all crimes in the United States and fewer than one in five is ever solved. In consequence, the home-protection industry is booming and national sales of electronic thief-repellents have risen from $15 million in 1966 to $40 million this year, with a projected $185 million in 1975.

Security devices are available for home or business which can detect a marauder by his footfall, body movement, heartbeats or breathing. Forthwith they greet him with wailing locks, screaming sirens, video-tape cameras, blinding lights, facefuls of tear gas or utter silence while a watchful gadget calls the cops. Savagely trained guard dogs are available from $550 to $1,500 each; but they sometimes have the drawback of keeping everybody out of the house, including innocent strangers, members of the family and residents. So ever-helpful science has come up with a $2.50 tape recording of a dog's bloodcurdling bark calculated to scare off all intruders not cunning enough to wait out the 20 minutes' duration to see if Cerberus just switches himself off.

Unfortunately, modern criminals become more scientifically sophisticated as the defenses ranged against them grow more complex. Escalation is not a military monopoly and larcenous ingenuity rises in time to counter each new protection set up by honest technology. At a recent London exhibition of the last word in modern safes, a security expert said, "There is a way to open every one of these safes. They were designed by men and men can break them." His professional realism was supported by the president of Westinghouse's home-protection division who conceded: "One hundred percent security in the home or Fort Knox—is just not possible. We're offering reduced risk, not invulnerability."

In the face of such expert opinion that there can be no ultimate security, perhaps we ought to rethink from first principles the hazards of property-owning. Maybe the only certain way to ensure a peaceful life is to treat the criminal with discouragement rather than deterrent. The golden rule to avoid his depredations could be to take care not to own anything both covetously valuable and humanly portable. Hermits, paupers and monks are rarely robbed but aspiring Gettys must have their midnight gardens aprowl with watchdogs. What can it profit a man if he has walls papered with Impressionists but can't sleep for worrying about somebody pinching them? Is ownership of priceless tiaras true compensation for the neuroses nurtured by the need to set your electronic defenses on sleeping, waking, going out or coming in?

Perhaps in these material times we place too much store on the possession of expensive but superfluous things. Robert Burton, in his "Anatomy of Melancholy," might have been commenting today when he noted that the rich are indeed possessed by their riches rather than possessors. Thoreau indicated that most of the luxuries and many of the so-called comforts of life are not only dispensable, but positive hindrances to the elevation of mankind. Gauguin did his exemplifying bit by taking his artistic hat to a palm hut in Tahiti and the moon and sixpence. And Thurber's Aunt Sarah Shoaf, who lived in continual fear that burglars would blow chloroform under her bedroom door, applied the self-denial principle nightly when she piled her money, silverware and other valuables outside in the corridor, with a note: "This is all I have. Please take it and don't use the chloroform."

To those more selfishly and sybaritically inclined, Doctor Samuel Johnson offered his sensible advice that it is better to live rich than to die rich. But even if, after living higher than larks, life has been so unkind as to leave you still loaded with wealth, just reflect, as Tutankhamen too late discovered, that you can't take it with you. Better by far to eschew all worldly goods that attract the light-fingered. Resolve to live the life of spartan Riley, pack up all your thief-luring valuables into neat, brown paper parcels and mail them to me, care of the SMITHSONIAN.

When I say Chrysler gives every Imperial a road test, I don't mean they just drive it around the block.

They give it a road test.

I've seen the way Chrysler builds cars; they really care about their product. And when it comes to the Imperial, they don't stop with just building it. They run it through a road test that gives it over 100 different checks. From the windshield wipers to the transmission.

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Look inside an Imperial. Examine some of the things they check during the road test. The way the seats work. The fit of the glove box door. The operation of the windows.

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If everybody would do as much as the automobile industry is doing to clean up our environment, we'd be well on the way to solving many of our problems.

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It helps keep the engine tuned longer. And a tuned engine means a cleaner exhaust.

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Well, the Chrysler people have been doing something to help keep that from happening. They dip their car bodies in special solutions to help prevent corrosion.

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I drive an Imperial. What else? It's big and beautiful and plush . . . and my snooty friends love to sit back in it.

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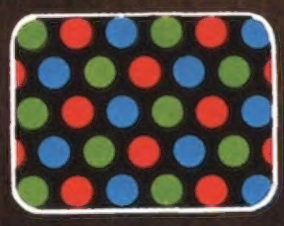

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